

MIDWAY

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MORTAL KOMBAT



OPERATIONS MANUAL

- * Operation & Adjustments
- * Testing & Problem Diagnosis
- * Parts Information
- * Wiring Diagrams & Schematics



Mortal Kombat Instructions

Insert two coins to start a game; insert one coin to continue.

In a two player game, the loser pays and the winner stays.

Press the Punch and Kit buttons to attack an opponent.

Use the joystick to make the screen player jump or duck, and move left or right.

Use joystick and button combinations to discover secret moves.

MORTAL KOMBAT

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MORTAL KOMBAT

S E C T I O N
one

Operation

Safety Notices

The following safety instructions apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page before preparing your game for play.



AC POWER CONNECTION. Before connecting the game to the AC power source, verify that the "line voltage selection chart" jumper wires are installed correctly for the line voltage in your area. For details, refer to Section 3.

PROPERLY GROUND THE GAME. To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. MIDWAY games should only be plugged into a grounded 3-wire outlet. Shocks will also result, if the control panel is not properly grounded! After servicing any parts on the panel, assure that the ground wires are secure. Only then should you lock up the game.

DISCONNECT POWER DURING REPAIRS. To avoid electrical shock, disconnect the game from the AC power source before removing or repairing any part of the game.

USE THE PROPER FUSE. To avoid electrical shock, use the replacement fuse which is specified in the parts list for this game. The replacement fuse must match the original fuse in fuse type, voltage rating, and current rating.

MONITOR PRECAUTIONS. When removing or repairing the monitor, extra precautions must be taken to avoid electrical shock because high voltages may exist within the monitor circuitry and cathode ray tube (CRT) even after power has been disconnected. Do not touch internal parts of the monitor with your hands or metal objects! Always discharge the CRT by the following method: Attach one end of a large, well-insulated, 20-kV jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

HANDLE FLUORESCENT TUBE AND CRT WITH CARE. If you drop a fluorescent tube or CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from the implosion.

ATTENTION !

PROPERLY ATTACH ALL CONNECTORS. Make sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty. All connectors are keyed to fit specific pins on each board.

Setup Procedure

INSTALLATION & INSPECTION

1. Remove all items from shipping container and set them aside. Inspect the exterior of the cabinet for any damage. Remove the shipping cleats from the bottom of the cabinet.
2. The keys are either taped to the coin return slot, or attached to joystick. Unlock and open the coin and cash box doors. Remove the leg levelers and spare parts which are stored in the cash box.
3. Tilt or lay the cabinet down. Locate the four threaded holes on the bottom of the cabinet (one in each corner), and install one leg leveler (with its hex nut) in each hole.
4. Stand the cabinet upright and make certain that it is in a stable position. Level the cabinet.
5. Remove the rear door of the cabinet. Inspect the interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.
6. Refer to the game's Cabinet Wiring Diagram (section 3), and check to see that all cable connectors are correctly secured. DO NOT FORCE CONNECTORS. Watch for damaged connectors and avoid making reversed connections.
7. Determine the value of your line voltage with a meter. Then, check the power input wires to the main power supply transformer. Be sure they are connected to taps which correspond to your local line voltage value. If necessary, reconnect the power input wires to the transformer in accordance with the Transformer Chart in section 3.
8. Lay the line cord (connected to the Power Chassis) in the slot along the bottom edge of the rear cabinet door. Replace the rear cabinet door. Close and lock the front coin and cash box doors.
9. Connect the line cord to a grounded (3-terminal) AC wall outlet.
10. Switch On the game, using the On/Off switch located on the upper left rear of the cabinet, to verify proper operation.

Game Location Requirements

Power

Domestic 115V @ 60 Hz
Foreign 230V @ 50 Hz

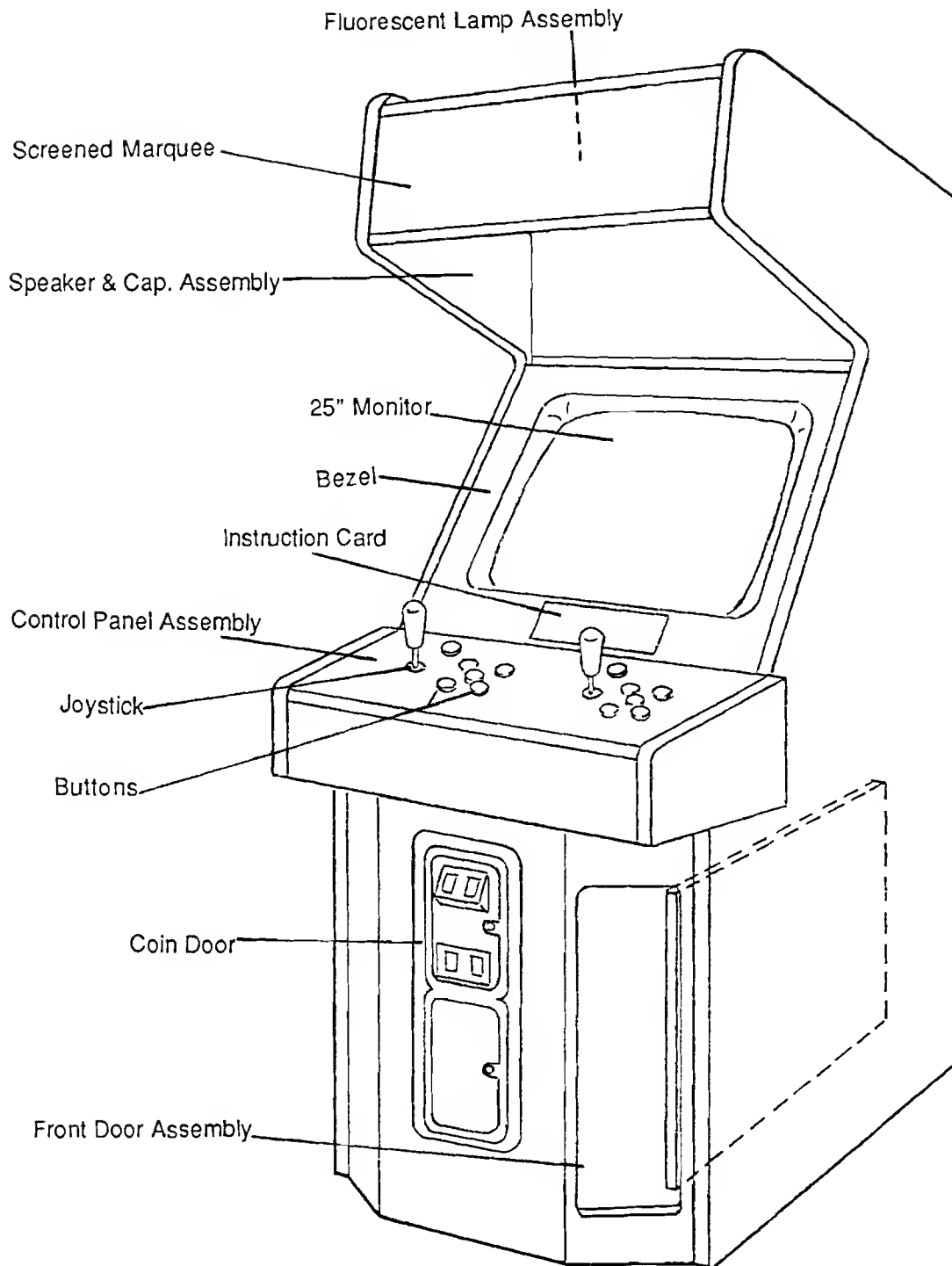
Temp.

32° F to 100° F
(0° C to 38° C)

Humidity

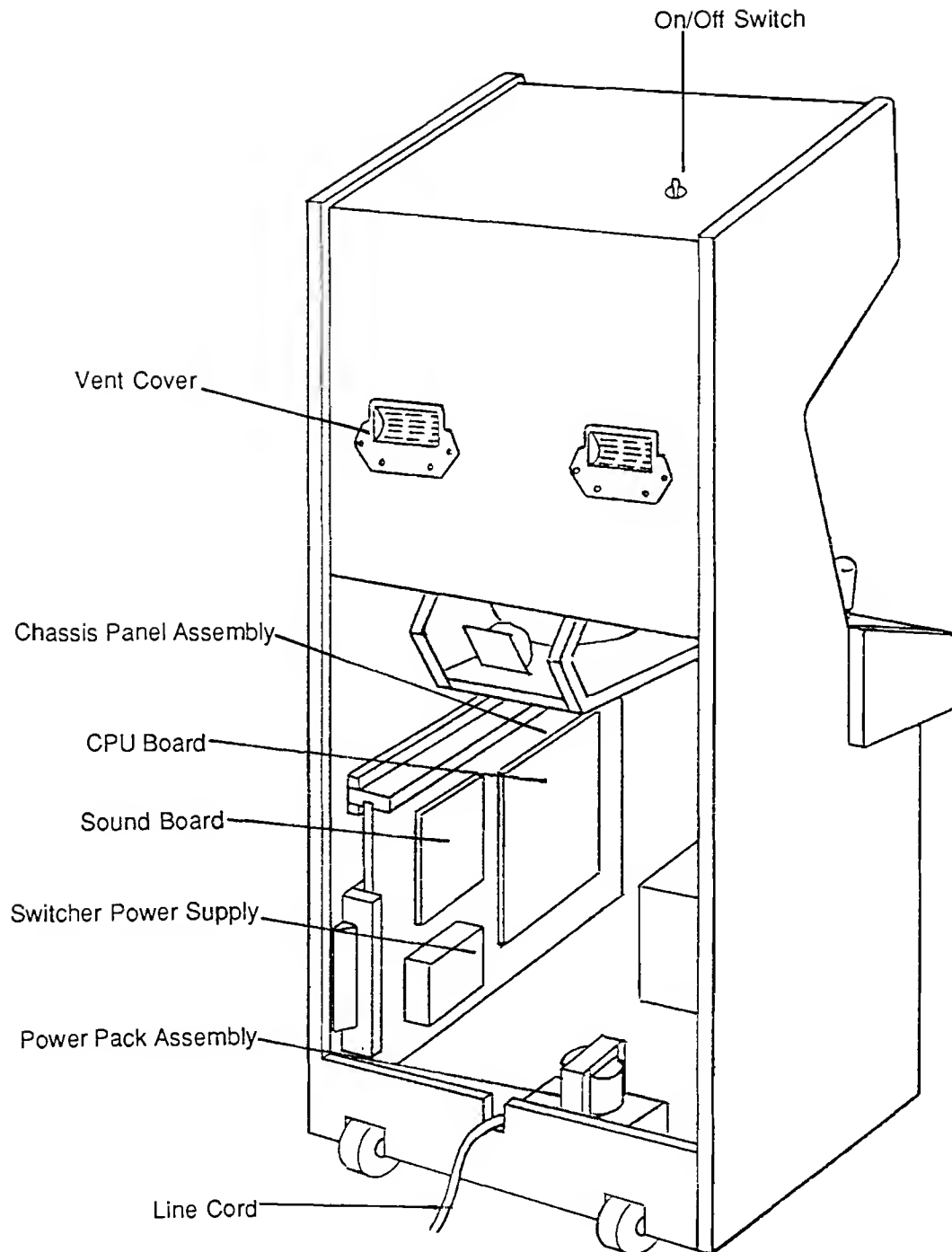
Not to exceed 95% relative.

Cabinet Assembly



Front View

Cabinet Assembly



Rear View

Servicing

■ Servicing the Control Panel

Switch Off power to the game. The control panel is held in place by two latches (located inside the cabinet, on the left and right sides of the control panel) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. To release the latches, lift the latch handle and unhook the wire fasteners. Carefully use the joysticks to lift the control panel. Tilt the control panel until it rests on its support bracket. To reinstall the control panel, check for proper cable connections, including the ground strap, and use the joysticks to lower it into position, avoiding pinched wires. Reclamp the latches.

Note

To remove the control panel for bench servicing, reach through the coin door opening and release the latches located on the sides of the control panel. Be careful not to reach straight back through the coin door opening as you might damage the Monitor Control Board. Tilt the control panel until it rests on its support brackets. Disconnect the cables and the ground strap. Lift the control panel out of the game cabinet.



Caution

The monitor DOES NOT contain an isolation transformer in its chassis (it is mounted instead in the Power Chassis Assembly located on the floor of the cabinet). When servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM THE LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.



Caution

While removing the four bolts, firmly support the monitor from the front of the CRT so that it will not slip.

■ Removal of Viewing Glass

Switch Off power to the game, and open the control panel. Remove the five hex head screws and the black metal strip at the bottom of the viewing glass. Carefully, slide the glass from its side grooves and lift it clear of the cabinet.

■ Removal of Monitor Bezel

Switch Off power to the game. Open the control panel and remove the viewing glass. Lift the bezel off of the monitor.

■ Monitor Replacement

We recommend that you read the WARNINGS section thoroughly before beginning this procedure.

Switch Off power to the game. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling, including its chassis ground strap. Remove the four bolts securing the monitor's mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet front.

■ Removal of the Marquee

Switch Off power to the game. Remove the five hex head screws from the black strip on top of the cabinet. Remove the strip and carefully lift the marquee. Store the marquee carefully to prevent damage.

The fluorescent tube is now accessible for replacement. Grasp the tube, give it a quarter turn, and remove it from its socket. Carefully place a new tube into the socket, and turn to reinstall.

WARNING

If you drop a fluorescent tube and it breaks, it will implode! Use care in handling.

■ Removal of the Fluorescent Light Assembly

Switch Off power to the game. Remove the marquee glass. Disconnect the fluorescent light assembly from its power cable. Remove the screws that hold the assembly to the cabinet then lift out the assembly.

■ Removal of the Speakers

Switch Off power to the game. Remove the marquee glass. The speakers pull out from the front of the cabinet. Be sure to disconnect the cabling and remove the nuts on the mounting screws before attempting to pull the speakers out of their enclosure. Carefully reinstall the seals upon completing any task in the speaker enclosure.

■ Volume Control, Test/Diagnostics Switch, and Service Credit Switch

Open the coin door to locate the game's volume control and Diagnostic switches on the small panel atop the cash box cover. The Volume Control is the white knob on left end of the panel. Turning the knob clockwise increases the volume. The upper right switch on the bracket is the Test/Diagnostics Switch that enables activating the game's Menu System. The lower right switch is the Service Credit Switch, which allows adding credits to a game for service testing without affecting the game's book-keeping total.

Note

When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

Game Features

STARTING UP

Switch on power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows MORTAL KOMBAT REVISION LEVEL, CMOS TEST OK and the COIN SETTING. The game then begins the Attract Mode.

Insert the desired amount of coins or tokens. Press the appropriate Start button.

Player Controls

Start Buttons

Each player has a Start Button which allows him/her to begin or continue play.

High Kick/High Punch Buttons

Allows the screen player to kick or punch an opponent in the upper body.

Low Kick/Low Punch Buttons

Allows the screen player to kick or punch an opponent in the lower body.

Block Buttons

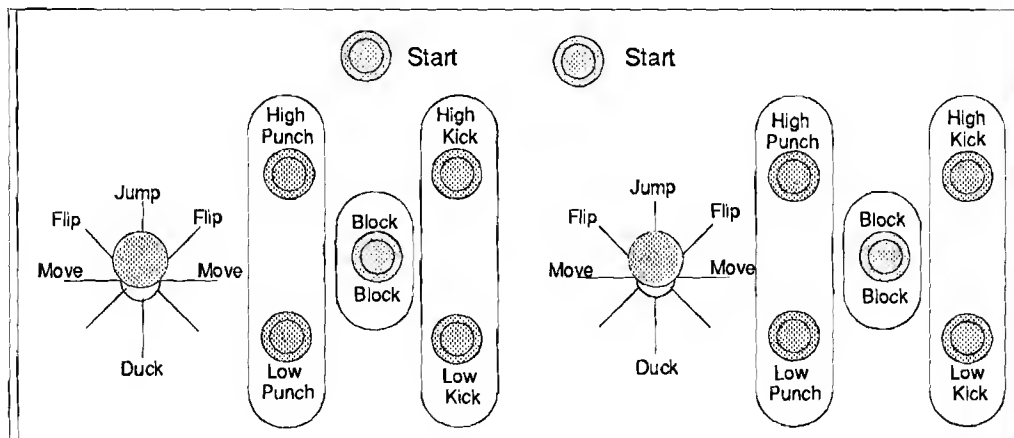
Allows the screen player to block an opponent's punch, kick or special move.

Joystick

Allows the screen player to move, flip, jump and duck.

Note

Discover secret moves by using joystick and button combinations.



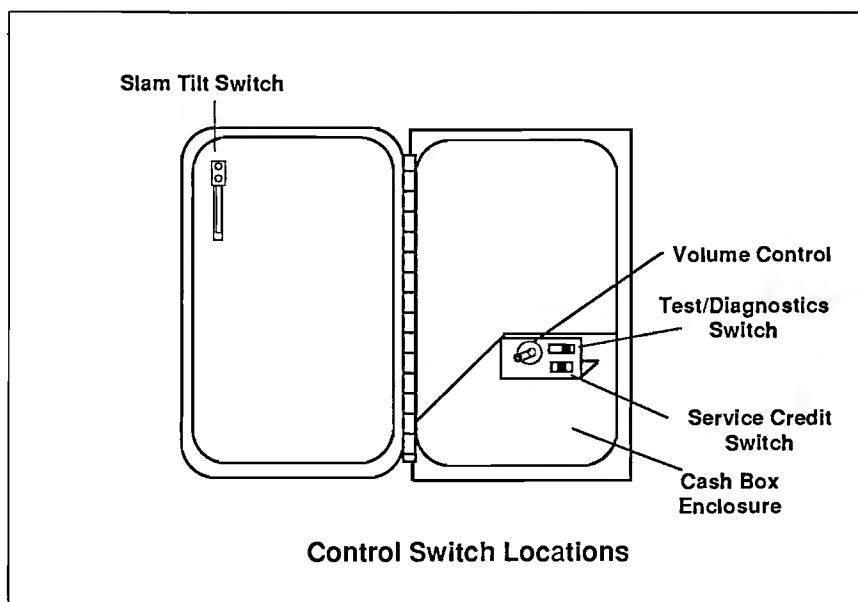
Control Panel

Game Operation

The MORTAL KOMBAT Control Switches are located inside the coin door. These switches allow the operator to customize some features of the game.

Control Switches

- The **Coin Door Slam Tilt Switch** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games.
- The **Volume Control** allows increasing or decreasing the volume level of the game music and speech. For greater profits, set your game's volume level at a nice loud setting.
- The **Test/Diagnostic Switch** (slide switch) allows you to activate the game's Menu System. Move the Test Switch to access the Main Menu. To exit the Menu System, select EXIT TO GAME OVER from the Main Menu, then press any control panel button.
- The **Service Credit Switch** (pushbutton switch) is a special feature switch that allots credit without affecting the game's book-keeping total.



Menu System Operation

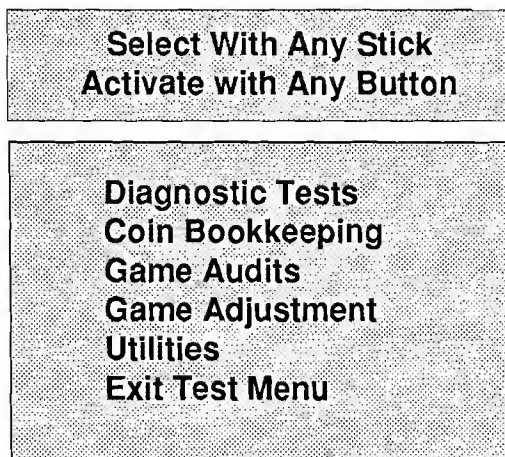
OPERATION

All MORTAL KOMBAT Game Audits, Adjustments, and Diagnostics are options of the Main Menu. Each option, in turn, has its own menu, listing several choices that you may act upon as desired.

Move the Test Switch (on the cashbox lid panel), or close Switch #8 of DIP Switch Bank #2, to activate the Main Menu (shown below). Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Press any button to activate a highlighted option.

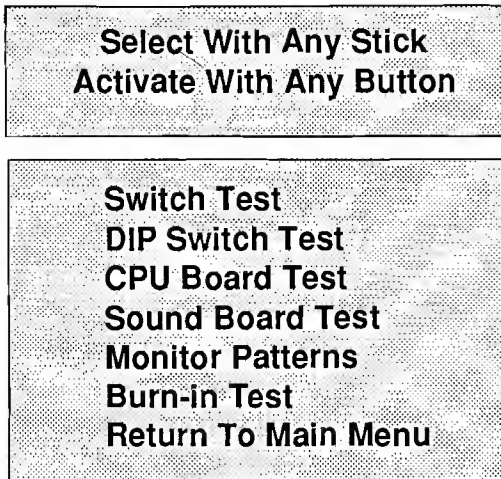
Note: Only highlighted options can be activated.



Main Menu

DIAGNOSTIC TESTS

To enter the Diagnostic Tests from the Main Menu, move any joystick to select (highlight) the Diagnostic Test option, and press any control panel button to activate the option.



Diagnostic Menu

Switch Test

The Switch Test allows the operator to test the switches on the control panel and the coin door.

Select the Switch Test by using any joystick to highlight the Switch Test option; then, press any control panel button to activate it. The top of the screen shows a layout of the control panel and the bottom of the screen lists the coin door switches. Pressing a switch causes the corresponding switch location on the screen to light. Release the switch and the screen returns to normal.

Press the Start buttons together to return to the Diagnostic Menu.

DIP Switch Test

The DIP Switch Test allows the operator to check the position of the two 8-position DIP Switches on the CPU Board. The operator can also change the setting of each position of each DIP Switch during this mode.

Use any joystick to select the DIP Switch Test and any control panel button to activate it. The screen displays a layout of their current settings.

To change a DIP Switch setting, press the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press any control panel button to return to the Diagnostic Menu.

DIP Switch 1 Settings Table

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
Violence On	Off * On							
Blood in game		Off * On						
Low Blow in game			Off * On					
Attract Sounds On				Off * On				
Not Used					Off * On	Off * On	Off * On	Off * On

DIP Switch 2 Settings Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
DIP Switch Coin A	Off * On							
Coinage		Off *	Off *	Off *				
USA 1 Ger 1 Fr 1		On	Off	Off				
USA 2 Ger 2 Fr 2		Off	On	Off				
USA 3 Ger 3 Fr 3		On	On	Off				
USA 4 Ger 4 Fr 4		Off	Off	On				
USA ECA Ger ECA Fr ECA		On	Off	On				
N/U N/U N/U		Off	On	On				
N/U N/U N/U Free Play		On	On	On				
Country					Off *	Off *		
USA					On	Off		
German					Off	On		
French					On	On		
Not Used								
One Counter Two Counters							Off * On	
Not Used								Off * On

* Indicates Factory Setting

CPU Board Test

The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Select the CPU Board Test with any joystick; then, press any control panel button to activate the automatic test of the CPU Board's RAMs and ROMs. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs, and ROMs. A ROM or RAM location that is shown as black with a white outline is used and should turn either red or green. A ROM or RAM location that is shown as gray with a white outline is not used in this game. During the test, ROM or RAMs are good, if they turn green; they are faulty, if they turn red.

The CPU Test pauses when a bad ROM or RAM is detected. Press any button to continue the test.

Sound Board Test

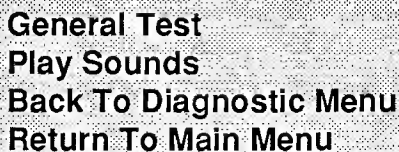
The Sound Test allows listening to some of the sounds that this game is capable of producing. This test also emits a tone for each fault that is detected.

Select the Sound Board Test with any joystick; then, press any control panel button to activate the test. The screen displays two test options:

GENERAL TEST analyzes the sound circuitry. The screen shows a list of error codes. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones or no tone at all to sound.

PLAY SOUNDS tests synthesized & digitized sounds from the Sound Board. Advance to the next sound by moving any joystick, and press any control panel button to activate the sound.

Select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU. Press any control panel button to activate your selection.

A rectangular screen with a light gray, textured background. It contains four lines of black text, each preceded by a small black square icon.

General Test
Play Sounds
Back To Diagnostic Menu
Return To Main Menu

Sound Test Menu

Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor. Select the test with any joystick and activate with any control panel button. Once the Monitor Patterns Test is activated, move any joystick to select a test option; press any control panel button to activate the option. Press any control panel button again to return to the Monitor Patterns Test menu.

Select With Any Stick
Activate With Any Button

Red Screen
Green Screen
Blue Screen
Color Bars
Crosshatch Patterns
Back To Diagnostic Menu
Return To Main Menu

Monitor Pattern Menu

The **RED**, **GREEN**, and **BLUE SCREEN** tests fill the screen with either red, green or blue.

The **COLOR BARS** test fills the screen with several shades of colors to help with red, green and, blue level adjustments. Each color should appear sharp and clear.

The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should appear round.

If any of the Monitor Pattern Tests shows a need for adjustment, use the proper white knobs on the Monitor Board.

Use any joystick to select **RETURN TO MAIN MENU** or **BACK TO DIAGNOASTIC MENU** and activate with any control panel button.

Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Move any joystick to select the Burn-in Test; then, press any control panel button to activate the test. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. The second page of the Audit Table specifies the number of Burn-in cycles successfully completed. Use this test to find intermittent CPU problems.

To exit this test, switch the game Off then On again.

COIN BOOKKEEPING

To enter the Coin Bookkeeping from the Main Menu, move any joystick to select the Coin Bookkeeping option; then, press any control panel button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item; the right side shows the number of coins, credits, or plays for each item.

To exit Coin Bookkeeping, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

Left Slot Coins	0
Right Slot Coins	0
Thlrd Slot Coins	0
Fourth Slot Coins	0
Service Credits	0
Paid Credits	0
Total Plays	0
Plays Until High Score Reset	5000
More Detailed Data	
Return To Main Menu	

Coin Bookkeeping Table

Left Slot Coins	0
Right Slot Coins	0
Third Slot Coins	0
Fourth Slot Coins	0
Total Collections	0
Clear Coin Meters	
Return To Main Menu	

Total Collection Table

GAME AUDITS

To enter Game Audits from the Main Menu, move any joystick to select the Game Audits option; then, press any control panel button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page", or "Previous Audit Page"; then, press any control panel button to change the page.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item; the right side shows the amount of play.

Hours Game Was Played	0
Total Play Time	0
Hours Played With 1 Player	0
Hours Played With 2 Players	0
Total Plays	0
Continues Taken	0
Burn-in Loops Successfully Completed	0
Next Audit Page	
Return To Main Menu	

Page 1 of Audit Table

Cage Chosen	0
Kans Chosen	0
Raiden Chosen	0
Sub-zero Chosen	0
Scorpion Chosen	0
Sonya Chosen	0
Error Traps	0
Previous Audit Page	
Return To Main Menu	

Page 2 of Audit Table

To exit the Game Audit Table, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate your selection.

GAME ADJUSTMENTS

Move any joystick to select the Game Adjustment option on the Main Menu; then, press any control panel button to activate it.

The Game Adjustments Menu allows the owner/operator to change the Game Pricing and Game Difficulty.

The Game Adjustments Menu offers several options. Each option has several choices. Move any joystick to select an option; then, press any control panel button to activate that option. The next menu screen provides a setting choice. Move any joystick to modify the setting value; then, press any control panel button to lock in the new value and return to the Adjustment Menu. Move the joystick up to increase the setting value, move the joystick down decrease the setting value.

To exit the Adjustments Menu, use any joystick to select RETURN TO MAIN MENU; then, use any control panel button to activate your selection.

Select With Any Stick
Press Any Button To Modify

Return To Main Menu
Standard Pricing
Custom Pricing
Free Play
Computer Difficulty
Winning Streak Reset
Return To Main Menu

Game Adjustment Menu

Note

Game Adjustments are explained in more detail on the following page.

Adjustment values set by DIP Switch, override adjustment values set by the menu system.

Game Adjustments

Standard Pricing

Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table. See page 1-19.

Modify the setting value with any joystick. Press any control panel button to lock in the new value and return to the Adjustment Menu.

Custom Pricing

Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the maximum amount of credits per game, the amount of credits required to start a game, and the amount or credits required to continue a game. This option is being adjusted from the Dip Switch Settings. See page 1-20.

Modify the setting value with any joystick. Press any control panel button to lock in a new value and return to the Adjustment Menu.

Free Play

This option selects free play. The setting choices for this adjustment are:

- No (factory)
- Yes

Computer Difficulty

This option determines the difficulty level of game play. The setting choices for this adjustment are:

- 1 (Extra Easy)
- 2 (Easy)
- 3 (Medium; factory)
- 4 (Hard)
- 5 (Extra Hard)

Winning Streak Reset

This option resets the highest scores after a selected amount of games are played. The setting choices for this adjustment are:

- Reset every 5,000 games.
- Reset every 10, 000 games (factory).
- Reset every 15, 000 games.
- Do Not Reset.

Standard Pricing Table

Name	Settings Credit/Coin	Left Chute	Center Chute	Right Chute	Fourth Chute
USA 1	1/25¢	25¢		25¢	
USA 2	1/50¢	25¢		25¢	
USA 3	1/50¢, 3/\$1.00	25¢		25¢	
USA 4	1/50¢, 4/\$1.00	25¢		25¢	
USA ECA	1/25¢, 4/\$1.00	\$ 1.00	10¢	25¢	5¢
German 1	1/1 DM, 6/5 DM	1 DM		5 DM	
German 2	1/1 DM, 7/5 DM	1 DM		5 DM	
German 3	1/1 DM, 8/5 DM	1 DM		5 DM	
German 4	1/1 DM, 5/5 DM	1 DM		5 DM	
German ECA	1/1 DM, 2/2 DM, 6/5 DM	5DM	1DM	2DM	
France 1	2/5 F, 5/10 F	5 F		10 F	
France 2	2/5 F, 4/10 F	5 F		10 F	
France 3	1/5 F, 3/10 F	5 F		10 F	
France 4	1/5 F, 2/10 F	5 F		10 F	
France ECA	1/3 X 1 F, 2/5 F, 5/2 X 5 F	1F	10F	5F	
Swiss	1/1 F, 6/5 F	1 F		5 F	
Italy	1/500 Lire	500 Lire		500 Lire	
UK 1	1/20 P, 3/50 P	20 P		50 P	
UK ECA	1/30 P, 2/50 P, 4/£1.00	£1.00	20P	50 P	
Spain 1	1/25 Peseta, 5/100 Peseta	25 Peseta		100 Peseta	10 P
Japan 1	1/100 Yen	100 Yen		100 Yen	

If option desired is not shown above, use custom pricing .

Custom Pricing

Select With Any Stick
Press Any Button To Modify

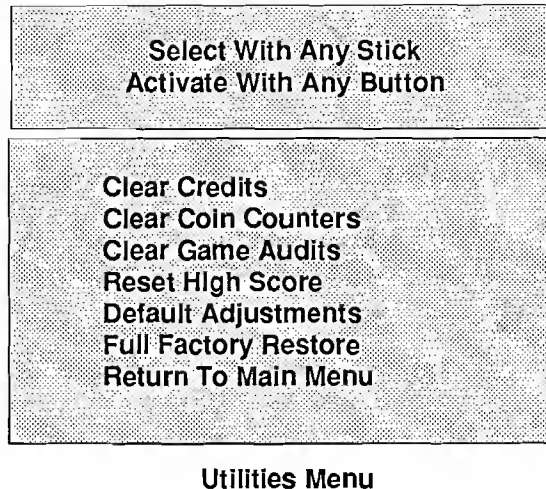
Return To Adj. Menu
(1) Left Chute Units
(1) Right Chute Units
(1) Third Chute Units
(1) Fourth Chute Units
(2) Units/Credits
(3) Units/Bonus
(4) Minimum Units Required
(5) Credits To Start
(6) Credits To Continue
(7) Coins Per Dollar
Maximum Credits
Return To Adj. Menu

- (1) Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in the fourth chute (see "units/credit").
- (2) This is the number of coin units required to buy one credit.
- (3) One bonus credit is awarded after this many coin units have accumulated.
- (4) No credits will be awarded until this many coin units have accumulated.
- (5) Each player needs this many credits to begin a game.
- (6) Each player needs this many credits to continue a game.
- (7) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals)
- (8) This is the limit for the credits counter. Additional coins inserted will be lost (factory setting: 30)

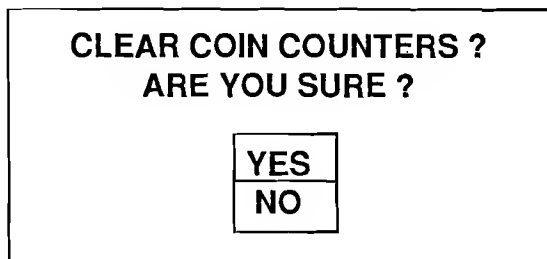
UTILITIES

Move any joystick to select the Utilities option on the Main Menu; then, press any control panel button to activate it.

The Utilities Menu allows the owner/operator to clear the game's bookkeeping memory and to install a custom message.



Move any joystick to select an item from the Utilities Menu; then, press any control panel button to activate that item. After an item has been activated, you are given the option of resetting that item or not. For example,



Move any joystick to choose YES or NO; then, press any control panel button to lock in your choice and to return to the Utilities Menu.

To exit the Utilities Menu, move any joystick to select RETURN TO MAIN MENU; then press any control panel button to activate your selection.

Troubleshooting

Problem

Possible Solution

No Picture or Distorted Picture.

Check for faulty video board or monitor. Check for disconnected video signal cable.

Turn game On and nothing happens.

Check line fuse. Check for +5Vdc at pins C, D, 3, and 4 of the JAMMA Connector.

No sound.

Check the speaker and speaker connection to pins L and 10 on the JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to the Sound Board.

No General Illumination.

Check the 1A., S.B. fuse.

Move joystick and the screen player does not move.

Check for open wires between the joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.

Press Start Button and nothing happens.

Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.

Press any control panel button and screen player does not move.

Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.

No credit given when coins are inserted.

Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA Connector or Coin Switch 2 and pin T of the JAMMA Connector.

Too many credits for number of coins inserted.

Check Game Pricing setting. Check for a short between pins T & 16 on the JAMMA Connector.

Game stays in test mode.

Check that the Test Switch in the coin door is set to Off.

MORTAL KOMBAT

S E C T I O N two

Parts

Cabinet Hardware

Cabinet Assembly	A-15639-40025
Shaft Caster	02-4404
Leg Leveler Plate	01-9155
Leg Adjuster, 3.0"	08-7377
Caster Wheel	20-9627
Power Switch Plate Assembly	A-15924
Power Switch	5640-13250-00
Front Door Assembly	A-14267
Latch Bracket	01-6994
Bezel & Instruction Card Set	A-15654
25" CRT Bezel	03-8497
Instruction Card	31-1697-40025
Coin Door Assembly	A-14975
Test Switch	A-13115
Coin Door Cable	H-14923
Coin Door, U.S.A.	09-20000-V-1
Line Voltage Cable Assembly	A-14201
Glass Retainer Bracket	01-9607
20" Vent Hole Cover	03-7602
Lamp Lock	03-8327
Glass Edge Channel	03-8358
Clear Glass	08-7456-4
Clear Glass	08-7456-10
Rear Door	11-1075
TAG Special Wrench	16-9074
Toggle Latch	20-9347
Long Arm Key T-20	20-9620
#555 Bulb, 6.3V	24-8768
Marquee	31-1644-40025
Marquee Retainer	03-8252-2

Speakers

Speaker & Cap Assembly	A-14968
Piezo Speaker Cable	H-14922
Speaker Cable	H-15701
Speaker Grille	01-10777
Cap. 10 μ f, non-pol, 50V, 20%	5045-12914-00
Tweeter Speaker, 4 Ω , 15W	5555-12924-00
6" Speaker, 4 Ω , 25W	5555-12929-00

Manuals

Monitor Manual	16-3000-103
Instruction Manual	16-40025-101

PC Boards

Chassis Panel Assembly	A-14157-3
Y-Unit CPU Assembly	A-13234-40025
Power Supply Assembly	A-15202-1
Sound Board Assembly	A-14732-40025

Transformer Assembly

Power Pack Assembly	A-15916
Line Cord Assembly	A-15921
Power Pack Chassis Assy	A-15915
Power Pack Jumper Cable	H-13265
Transformer Jumper Cable	H-13378
Line Filter Jumper Cable	H-15922
G.I. Jumper Cable	H-15945
Varistor, 130V, 10J	5017-09044-00
Line Filter, 5 Amp	5102-10310-00
Power Transformer	5610-13326-00
Fuse, SB, 1A, 250V	5731-06569-00
Fuse, SB, 3A, 250V	5731-10356-00
Fuse Holder, Panel	5733-12869-00

Fluorescent Lamp Assembly

Fluorescent Housing & Bracket	C-12679
Housing Mounting Brkt	01-9146
Light Fixture	20-9590
18" Fluorescent Bulb, 15 W	24-8809

Control Panel

Housing & Control Panel Assembly	A-15644
Control Panel Assembly	A-15645
Plate	A-15638
Control Panel Cable	H-15669
Latch Bracket	01-6994
Latch Bracket	01-9605
Wood Control Panel	11-1076
Red Pushbutton	20-9687-1
White Pushbutton	20-9687-2
Blue Pushbutton	20-9687-3
8-way Joystick	20-9694-1
Screened Overlay	31-1696-40025
Wood Housing	11-1018-2
Toggle Latch	20-9347

Monitor

Monitor Support Bracket	01-9969
25" Monitor	5675-12787-01

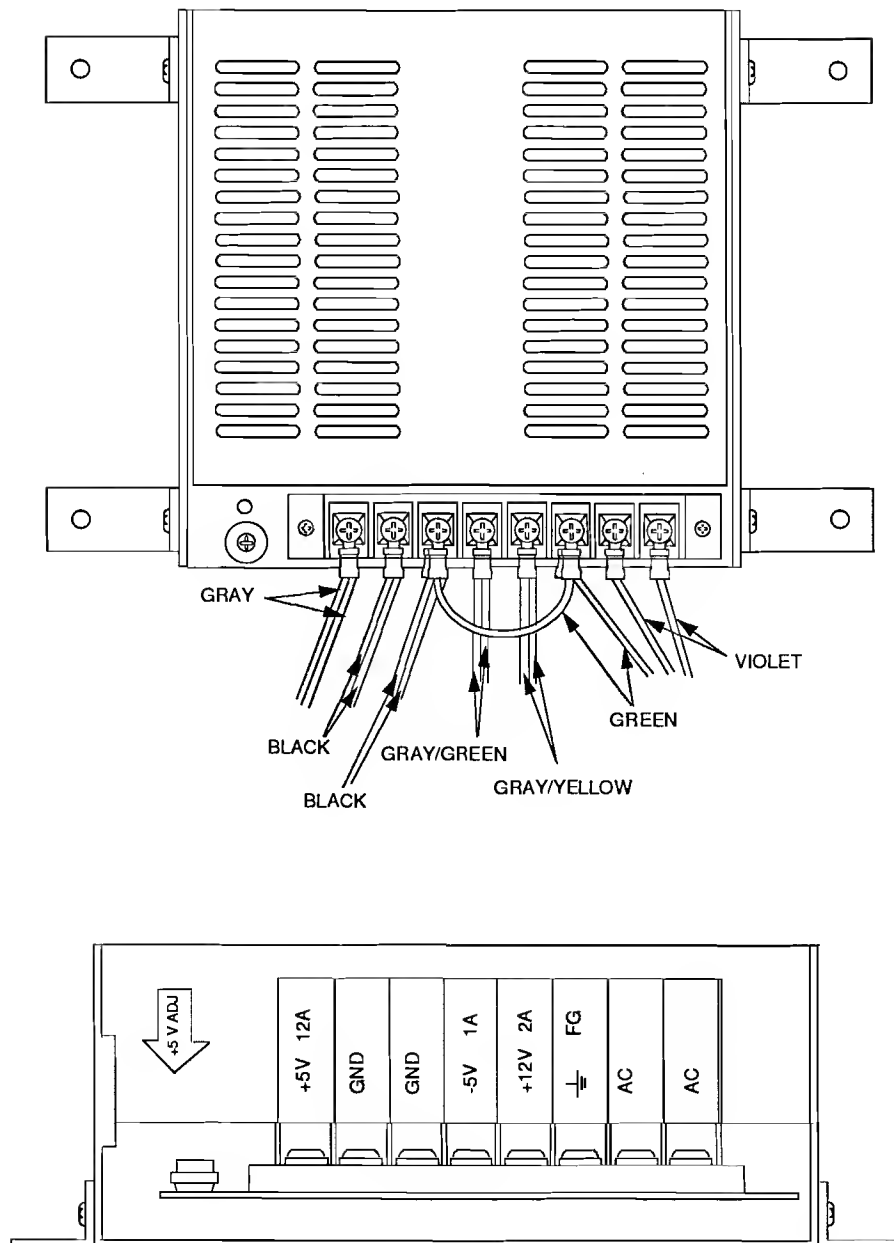
Cables

Power Pack Jumper	H-13265
Transformer Jumper	H-13378
Line Voltage Cable	H-14235
Piezo Speaker Cable	H-14922
Coin Door Cable	H-14923
Video Extension Cable	H-14924
Sound Power Speaker Cable	H-14925
Video Signal Cable	H-14949
Switch Power Cable	H-15203
Control Panel Cable	H-15669
Main Harness	H-15670
Speaker Cable	H-15701
Line Filter Jumper	H-15922
G.I. Jumper Cable	H-15945
20-pin Ribbon Cable	5795-10937-06

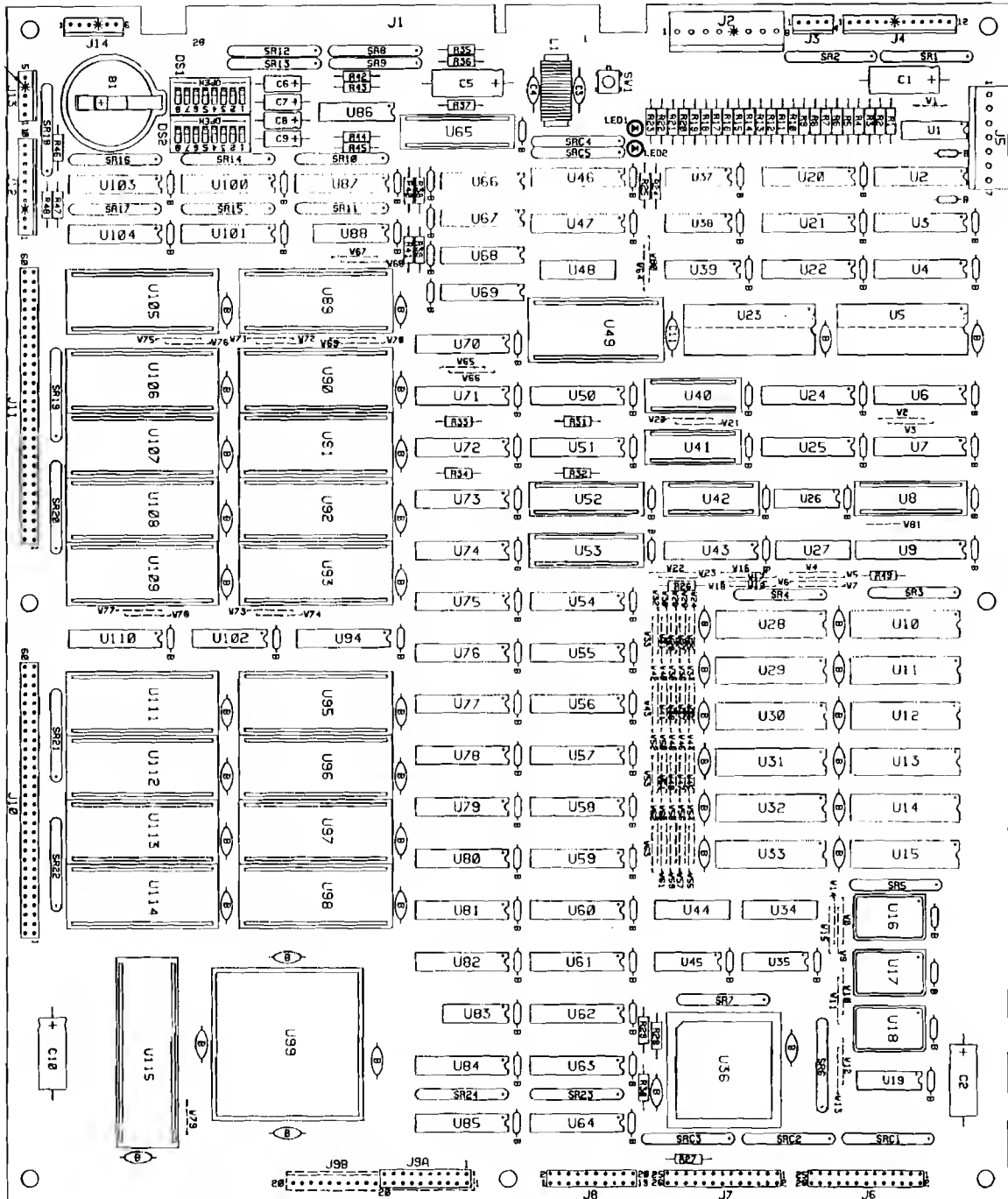
A-15202-1

Power Supply Switcher Assembly

Part Number	Description
H-15203	Switch Power Cable
01-10500	Mounting Bracket
01-10573	Shield
20-9700	P/S Switcher Supply



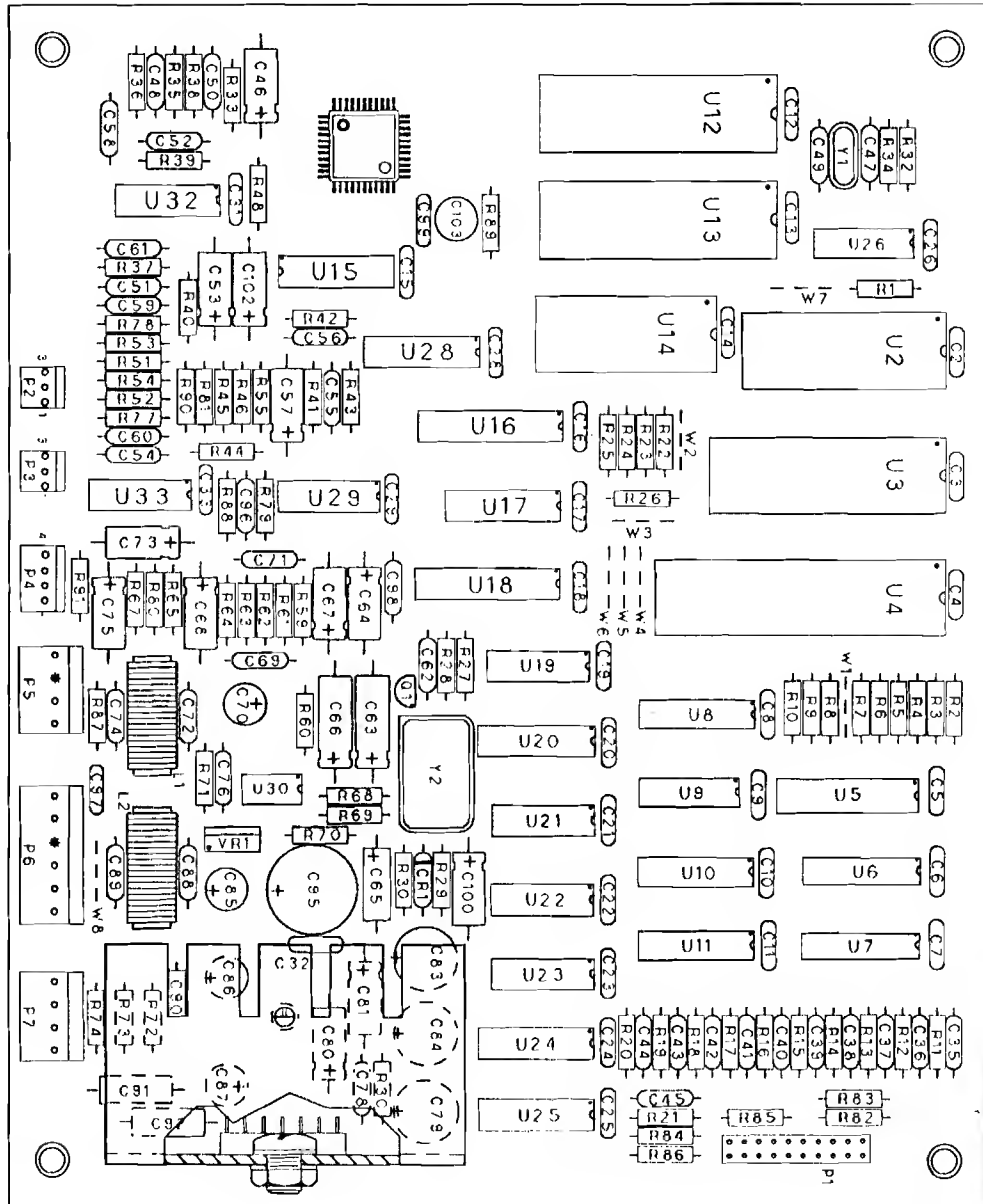
A-13234-40025 CPU Board Assembly



A-13234-40025 CPU Board Parts

Part Number	Designator	Description	Part Number	Designator	Description
5281-09737-00	U1	IC, 74LS86	5671-09019-00	LED1, LED2	LED, Red
5317-12211-00	U2, U20, U24, U43, U61, U62, U70	IC, 74ALS541	5551-09822-00	L1	Inductor, 4.7μH
5317-12212-00	U3, U6, U7, U21, U25, U50, U58, U63, U64, U71, U72, U74, U79, U84, U85	IC, 74ALS574	5645-09025-00	DS1, DS2	DIP Switch 16-pin
5317-12208-00	U4, U22, U54-U57, U59, U60, U75-U78, U80, U81, U94, U110	IC, 74ALS245	5641-12551-00	SW1	Pushbutton Switch
5340-12840-00	U5, U23	IC, 8K x 8 Static RAM	5881-12315-00	B1	Battery Holder
5700-12047-00	U8, U52, U53, U65	24-pin Socket	5791-10862-08	J2	8-pin Connector
5521-10421-00	U16	48Mhz Xtal	5791-12461-12	J4	12-pin Connector
5521-10318-00	U17	24Mhz Xtal	5791-10850-00	J6, J7	26-pin Ribbon Connector
5283-10468-00	U19, U45	IC, 74F74	5791-09437-00	J8	20-pin Ribbon Connector
5019-10849-00	U27, U34, U44, U48	100Ω DIP Res.	5791-12461-10	J12	10-pin Connector
5286-13209-00	U35	IC, 74AS00	5700-12252-00	U12-U15	24-pin Socket
5700-12253-00	U36	68-pin Socket	5791-12461-05	J13	5-pin Connector
5280-09309-00	U37	IC, 7407	5791-12461-04	J3	4-pin Connector
5281-09487-00	U38	IC, 74LS74	5791-12461-20	J9A, J9B	20-pin Connector
5434-12255-00	U39	MAX691	5791-12461-04	J14	6-pin Connector
5700-09915-00	U40, U41, U42	20-pin Socket	5880-11056-00	B1	Lithium Battery, 3A
5311-12287-00	U46, U47, U87, U100 U101, U103, U104	IC, 74HC541	03-8338-1		1/4" Spacer
5700-10176-00	U49	28-pin Socket	A-5346-40025-1	U8	IC, PLD Color RAM Control
5311-12285-00	U51, U73, U82	IC, 74HC573	5400-12220-00	U36	IC, TMS34010, 50 GSP
5340-12014-00	U66-U69	IC, 4464 DRAM, 64 x 4	A-5346-40025-2	U40	IC, PLD Address Decode
5283-10552-00	U83	IC, 74F04	A-5346-40025-3	U41	IC, PLD Video RAM Control
5370-12602-00	U86	IC, ULN2064B	A-5346-40025-4	U42	IC, PLD Local Control
5317-12023-00	U88	IC, 74ALS138	5340-12558-00	U49	IC, 8K x 8 Static RAM, 150ns
5700-12088-00	U89-U93, U95-U98, U105-U109, U111-U114	32-pin Socket	A-5346-40025-5	U52	IC, PLD Video RAM Sequencer
5700-12254-00	U99	114-pin Socket	A-5346-40025-6	U53	IC, PLD Image ROM Control
5317-12024-00	U102	IC, 74ALS139	A-5346-40025-7	U65	IC, PLD Miscellaneous Control
5700-08985-00	U115	40-pin Socket	A-5343-40025-1	U89	IC, Game EPROM
5010-08991-00	R1, R24, R27	4.7KΩ Res., 5%, 1/4W	A-5343-40025-10	U105	IC, Game EPROM
5010-10204-00	R2, R7, R12	1KΩ Res., 2%, 1/4W	A-5346-40025-8	U115	IC, PLD Autoerase Controller
5010-10205-00	R3, R8, R13	2KΩ Res., 2%, 1/4W	5410-12239-00	U99	IC, Custom ASIC
5010-10000-00	R4, R9, R14	3.9KΩ Res., 5%, 1/4W	5340-12213-00	U10-U15, U28-U33	IC, VRAM 64K x 4, 150ns
5010-09219-00	R5, R10, R15	8.2KΩ Res., 5%, 1/4W	5341-13297-00	U111	IC, ROM
5010-08772-00	R6, R11, R16	15KΩ Res., 5%, 1/4W	5341-13297-01	U95	IC, ROM
5010-09001-00	R23, R25	330Ω Res., 5%, 1/4W	5341-13297-02	U106	IC, ROM
5010-09036-00	R26, R29-R34, R50 R51	100Ω Res., 5%, 1/4W	5341-13297-03	U112	IC, ROM
5010-09416-00	R35-R37, R46-R48	470Ω Res., 5%, 1/4W	5341-13297-04	U96	IC, ROM
5010-08997-00	R38-R45	2.7KΩ Res., 5%, 1/4W	5341-13297-05	U107	IC, ROM
5010-09534-00	W2, W8, W11, W12, W14, W21, W22, W24, W27, W29, W30, W32, W34, W36, W39, W41, W42, W45, W47, W48, W50, W52, W55, W57, W58, W60, W62, W65, W68, W69, W71, W73, W75, W77, W80	0Ω Res., 1/4W	5341-13297-06	U113	IC, ROM
5043-08980-00	B	.01μf Cap., 10V, Axial	5341-13297-07	U97	IC, ROM
5040-08986-00	C1, C2, C5, C10	100μf Cap., 10V, Axial	5341-13297-08	U108	IC, ROM
5043-09845-00	C3, C4	.001μf Cap., 10V, Axial	5341-13297-09	U114	IC, ROM
5041-09243-00	C6-C9	10μf Cap., 10V, Axial	5341-13297-10	U98	IC, ROM
5043-08996-00	C11	.1μf Cap, Axial	5341-13297-11	U109	IC, ROM
5019-12611-00	SR1, SR3, SR8, SR9, SR12, SR13, SR18	470Ω SIP, 5 Res.			
5019-09362-00	SR3, SR4, SR6, SR7, SR11, SR15, SR17, SR19, SR20, SR21, SR22, SR23, SR24, SRC1, SRC2, SRC3	4.7KΩ SIP, 9 Res.			
5019-10143-00	SR5	470Ω SIP, 9 Res			
5060-10396-00	SRC4, SRC5, SRC10, SRC14, SRC16	4.7KΩ SIP, 470pf			

A-14732-40025 Sound Board Assembly



A-14732-40025

Sound Board Parts

Part Number	Designator	Description	Part Number	Designator	Description
5340-12958-00	U7, U11, U24	IC, 26LS31	5040-09421-00	C70, C85-C87, C103	100µf Cap., 25V
5340-12959-00	U6, U10, U25	IC, 26LS32	5040-09506-00	C79, C83, C84	220µf Cap., 16V
5281-09850-00	U19	IC, 74LS11	5040-12670-00	C95	2200µf Cap., 16V
5281-09215-00	U26	IC, 74LS04	5070-08919-00	CR1	1N4148 Diode
5281-09851-00	U21	IC, 74LS14	5160-12891-00	Q1	MPS3646 Trans.
5281-09487-00	U9, U22, U23	IC, 74LS74	5551-09822-00	L1, L2	4.7µH Inductor, 3A
5281-09745-00	U8	IC, 24LS138	5700-09006-00	U28	16-pin Socket
5281-09246-00	U20	IC, 74LS139	5700-09915-00	U18	20-pin Socket
5281-09733-00	U17	IC, 74LS174	5700-09004-00	U14	24-pin Socket
5281-09486-00	U5, U16	IC, 74LS374	5700-08985-00	U4	40-pin Socket
5340-12278-00	U2	IC, Static RAM, 8K x 8	5700-12088-00	U3, U12, U13	32-pin Socket
5370-12260-00	U30	IC, 3340 Attenuator	5791-10862-04	P5, P7	4-pin Header
5460-12743-00	VR1	IC, 7809 Regulator, +9V	5791-10862-06	P6	6-pin Header
5370-12960-00	U29	IC, LM324 Op Amp	5791-09437-00	P1	20-pin Header
5370-12730-00	U32, U33	IC, TL084 Op Amp	01-10516		Heat Sink
5371-12727-00	U15	AD7524 DAC	4406-01128-00		6-32 Hex Nut
5370-12963-00	U31	HA13116 Pwr. Amp	4006-01003-06		6-32 x 3/8 P-PH-S
5521-10931-00	Y2	8Mhz Oscillator	20-9690-18		Spacer, 1-1/8
5520-09020-00	Y1	3.58 Mhz Crystal	A-5343-40025-19	U3	IC, EPROM
5010-09534-00	W2, W3, W5, W7, W8	0Ω Resistor	5400-10320-00	U4	IC, 68B09E, MPU
5010-12961-00	R72-R74	3.3Ω Res., 5%, 1/2W	A-5343-40025-20	U12	IC, EPROM
5010-09039-00	R89	10Ω Res., 5%, 1/4W	A-5343-40025-21	U13	IC, EPROM
5010-10170-00	R11-R21	47Ω Res., 5%, 1/4W	5370-11086-00	U14	IC, YM2151 Sound Generator
5010-09036-00	R4, R30, R90	100Ω Res., 5%, 1/4W	A-5346-40025-9	U18	IC, PLD Sound
5010-09187-00	R27	150Ω Res., 5%, 1/4W	5371-11087-00	U28	IC, YM3012 DAC
5010-09160-00	R83	220Ω Res., 5%, 1/4W	5433-12962-00	U1	IC, OKI6295, 4 Channel
5010-09416-00	R32, R43, R41, R82	470Ω Res., 5%, 1/4W	03-8338-1		Mtg. Spacer, 1/4"
5010-09358-00	R43, R68	1KΩ Res., 5%, 1/4W			
5010-08998-00	R22-R24, R26, R59, R61	2.2KΩ Res., 5%, 1/4W			
5010-08983-00	R28	3.3KΩ Res., 5%, 1/4W			
5010-10000-00	R87	3.9KΩ Res., 5%, 1/4W			
5010-08991-00	R1-R3, R5-R10, R25, R84-R86, R91	4.7KΩ Res., 5%, 1/4W			
5010-09219-00	R69	8.2KΩ Res., 5%, 1/4W			
5010-09034-00	R62, R63, R67, R70, R80	10KΩ Res., 5%, 1/4W			
5010-09269-00	R64	12KΩ Res., 5%, 1/4W			
5010-09324-00	R68	27KΩ Res., 5%, 1/4W			
5010-09325-00	R36	39KΩ Res., 5%, 1/4W			
5010-09035-00	R29, R53, R81	47KΩ Res., 5%, 1/4W			
5010-10987-00	R77, R78	56KΩ Res., 5%, 1/4W			
5010-10650-00	R38, R45, R51	62KΩ Res., 5%, 1/4W			
5010-08776-00	R31, R71	68KΩ Res., 5%, 1/4W			
5010-10257-00	R35	75KΩ Res., 5%, 1/4W			
5010-12927-00	R79	82KΩ Res., 5%, 1/4W			
5010-09162-00	R33, R48, R54, R55, R60, R65	100KΩ Res., 5%, 1/4W			
5010-12965-00	R39	130KΩ Res., 5%, 1/4W			
5010-09134-00	R40, R44, R46, R52	150KΩ Res., 5%, 1/4W			
5010-12964-00	R37, R42	820KΩ Res., 5%, 1/4W			
5048-11027-00	C59, C60	33pf Cap., 10%			
5043-10264-00	C50, C62	68pf Cap., 10%			
5043-09492-00	C35-C45, C47, C49, C98	100pf Cap., 10%			
5048-12748-00	C54, C61, C96	220pf Cap., 10%			
5048-11030-00	C71	470pf Cap., 10%			
5048-12506-00	C78	820pf Cap., 10%			
5048-11031-00	C48, C55, C76	1000pf Cap., 10%			
5048-11065-00	C69	2200pf Cap., 10%			
5048-12967-00	C58	2700pf Cap., 10%			
5048-11072-00	C51, C56	3300pf Cap., 10%			
5048-12966-00	C52	3900pf Cap., 10%			
5043-08980-00	C2-C26, C28, C29, C31-C33, C97, C99	.01µf Cap., 10%			
5045-12926-00	C90-C92	.1µf Cap., 10%			
5043-08996-00	C72, C74, C88, C89	.1µf Cap., 20%			
5048-12036-00	C65	.22µf Cap., 10%			
5040-09365-00	C68	1µf Cap.,			
5040-09343-00	C46, C53, C57, C64, C67, C73, C75, C81, C100, C102	10µf Cap., 16V, 20%			
5040-09332-00	C63, C66, C80	47µf Cap., 25V			

NOTES

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MORTAL KOMBAT

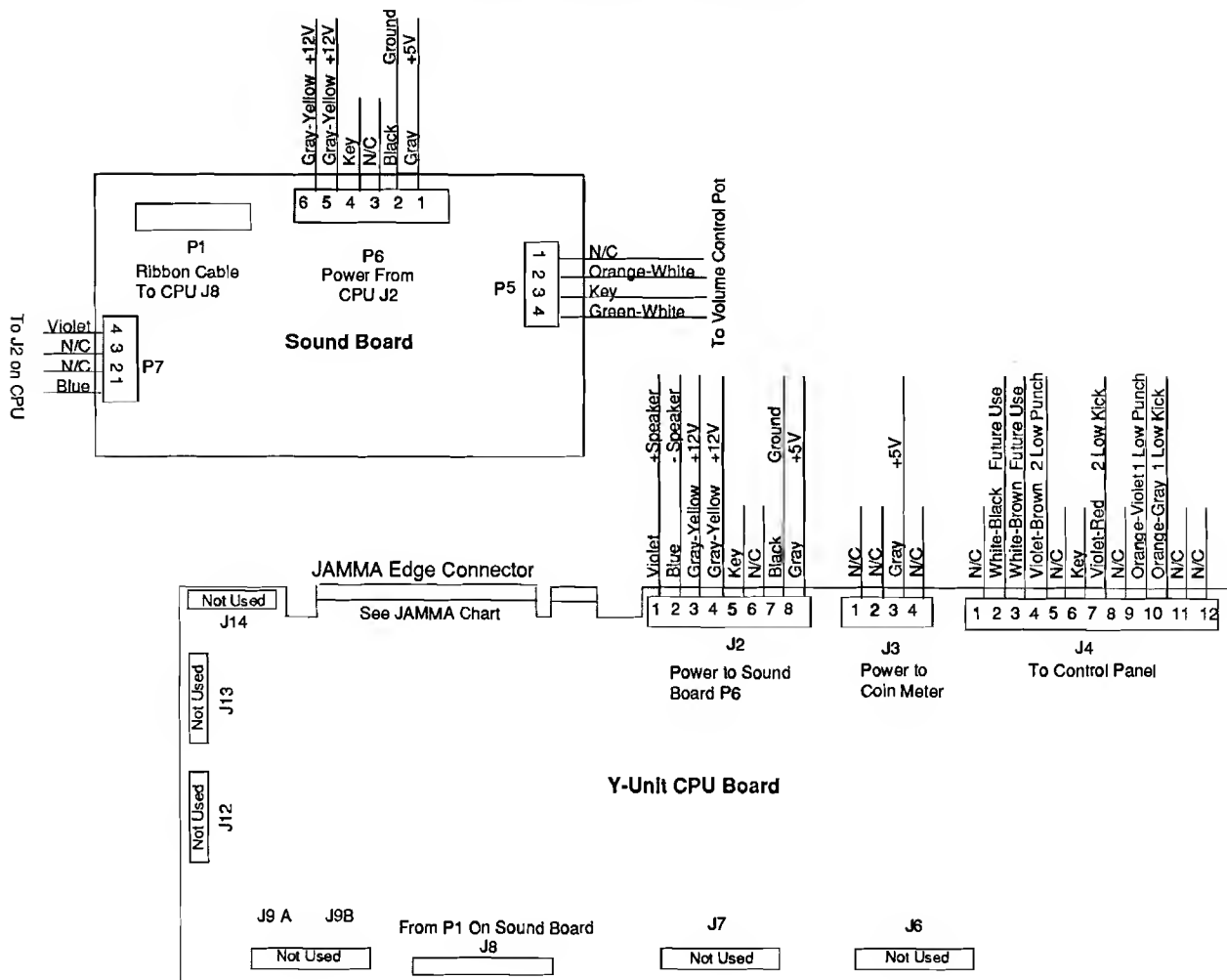
S E C T I O N three

Schematics and Wiring Diagrams

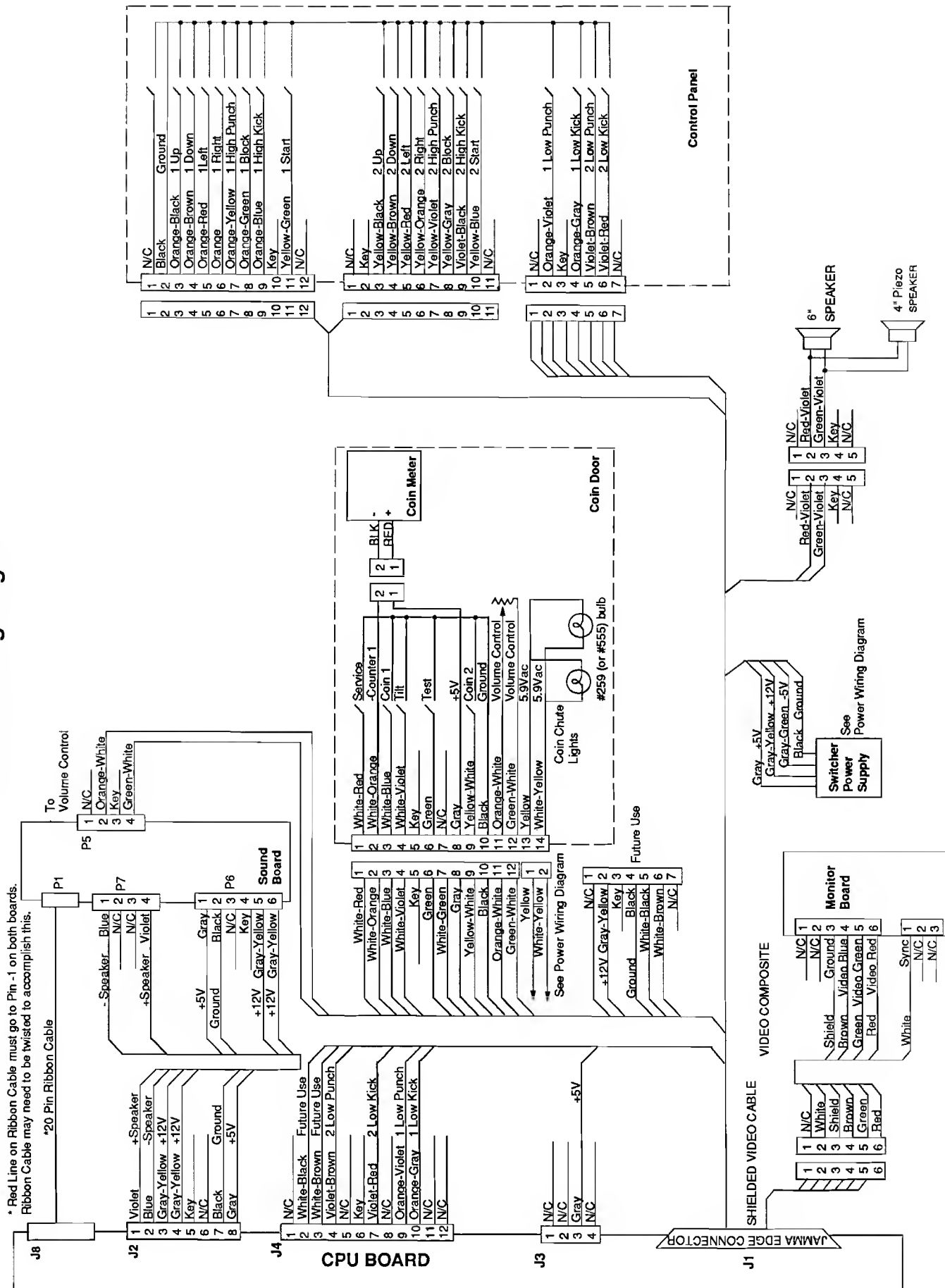
JAMMA Chart

Function	Wire Color	Pin	Pin	Wire Color	Function
Ground	Black	1	A	Black	Ground
Ground	Green-Brown	2	B	Black	Ground
+5 Volts DC	Gray	3	C	Gray	+5 Volts DC
+5 Volts DC	Gray	4	D	Gray	+5 Volts DC
-5 Volts DC	Gray-Green	5	E	Gray-Green	-5 Volts DC
+12 Volts DC	Gray-Yellow	6	F	Gray-Yellow	+12 Volts DC
	Key	7	H	Key	
Counter 1	White-Orange	8	J	White-Green	Counter 2
	N/C	9	K	N/C	
Speaker (+)	Red-Violet	10	L	Green-Violet	Speaker (-)
	N/C	11	M	N/C	
Video Red	Red	12	N	Green	Video Gm
Video Blue	Brown	13	P	White	Video Sync
Video Grd	Shield	14	R	White-Red	Service Credit
Test	Green	15	S	White-Violet	Slam Tilt
1 Coin	White-Blue	16	T	Yellow-White	2 Coin
1 Start	Yellow-Green	17	U	Yellow-Blue	2 Start
1 Up	Orange-Black	18	V	Yellow-Black	2 Up
1 Down	Orange-Brown	19	W	Yellow-Brown	2 Down
1 Left	Orange-Red	20	X	Yellow-Red	2 Left
1 Right	Orange	21	Y	Yellow-Orange	2 Right
1 High Punch	Orange-Yellow	22	Z	Yellow-Violet	2 High Punch
1 Block	Orange-Green	23	a	Yellow-Gray	2 Block
1 High Kick	Orange-Blue	24	b	Violet-Black	2 High Kick
N/C	N/C	25	c	N/C	N/C
N/C	N/C	26	d	N/C	N/C
Ground	N/C	27	e	N/C	Ground
Ground	Black	28	f	Black	Ground

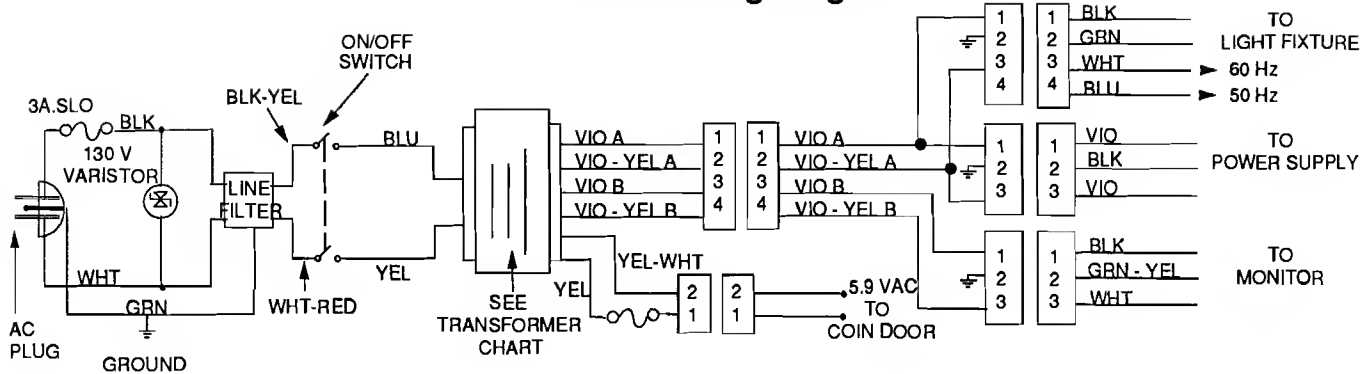
Interboard Wiring Diagram



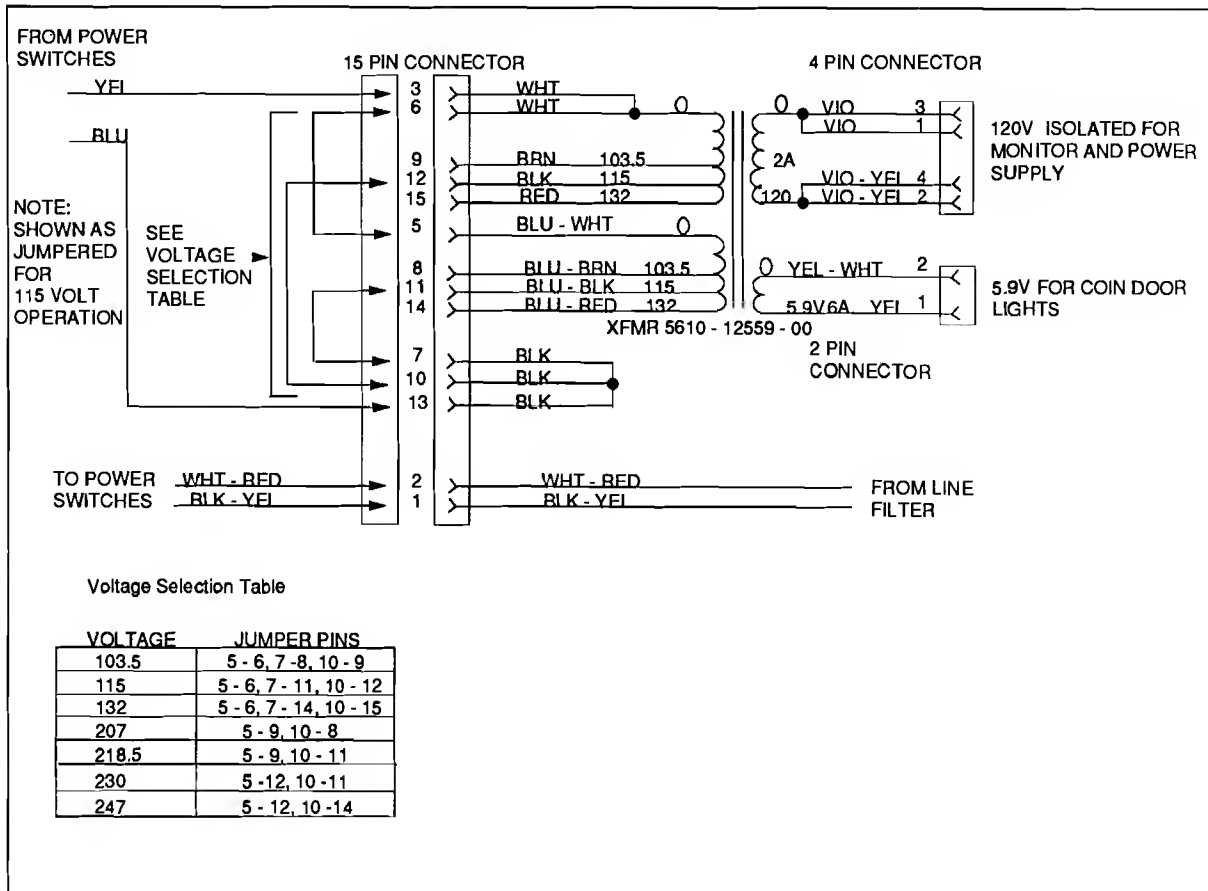
Cabinet Wiring Diagram



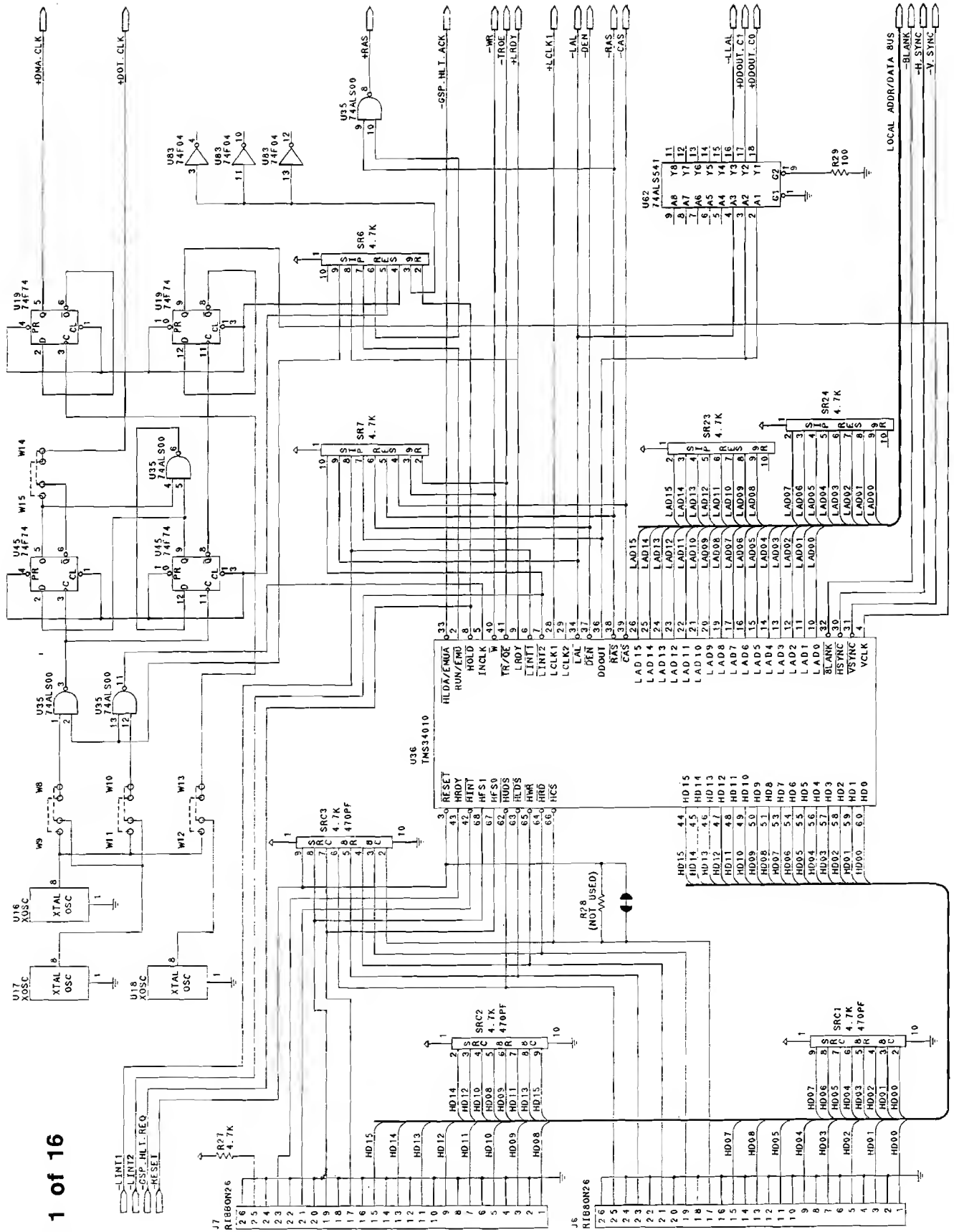
Power Wiring Diagram



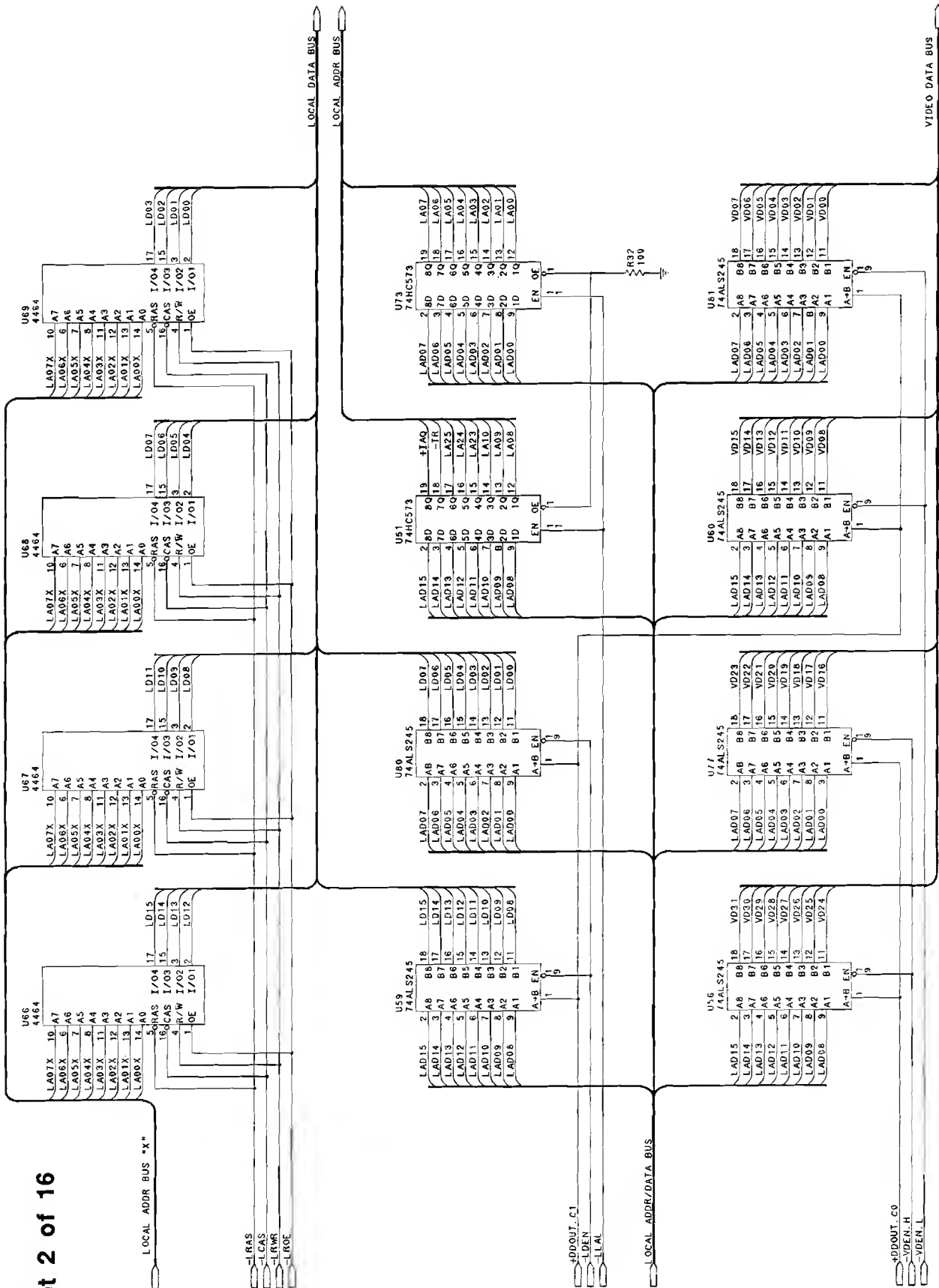
Transformer Chart



CPU Sheet 1 of 16



CPU Sheet 2 of 16

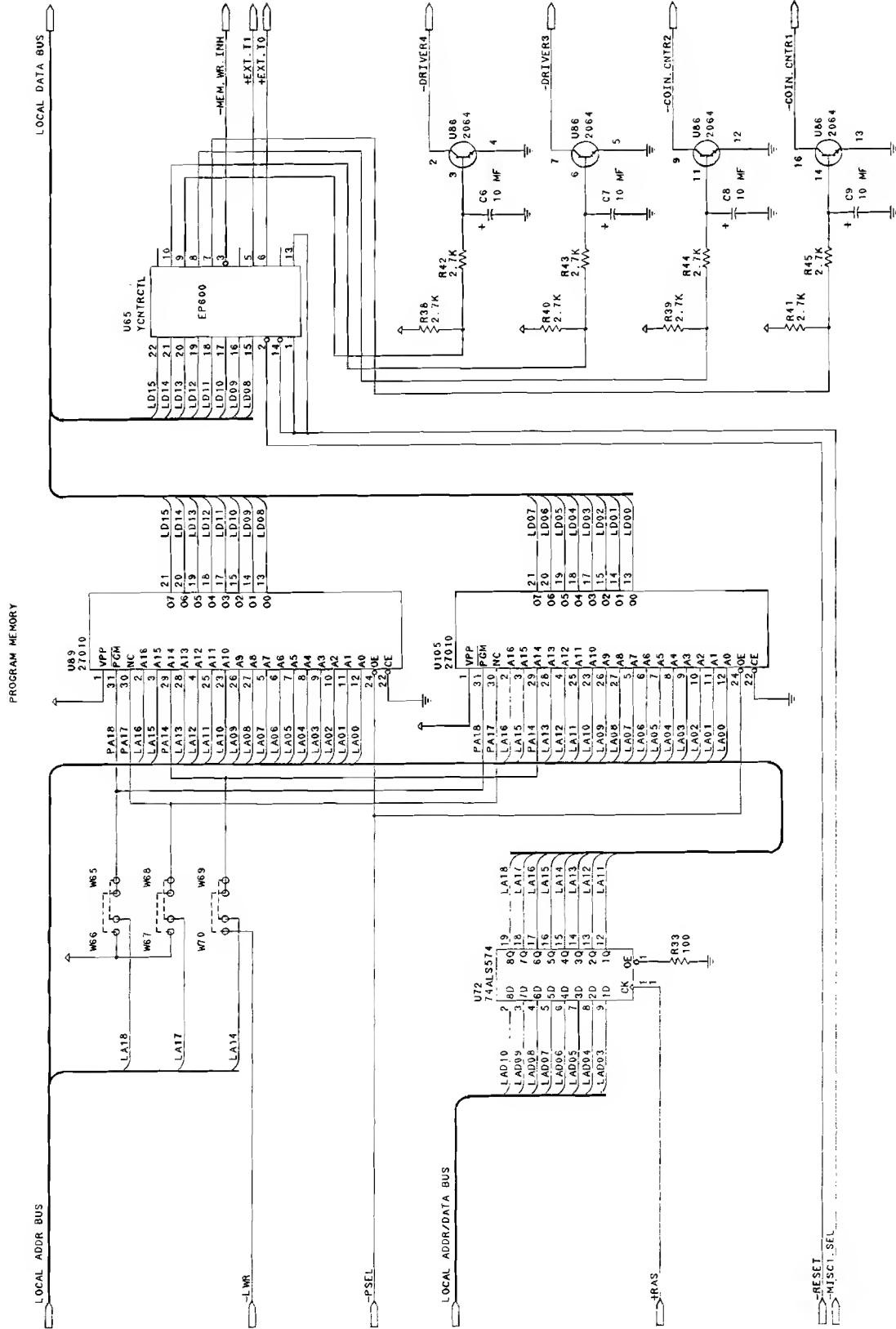


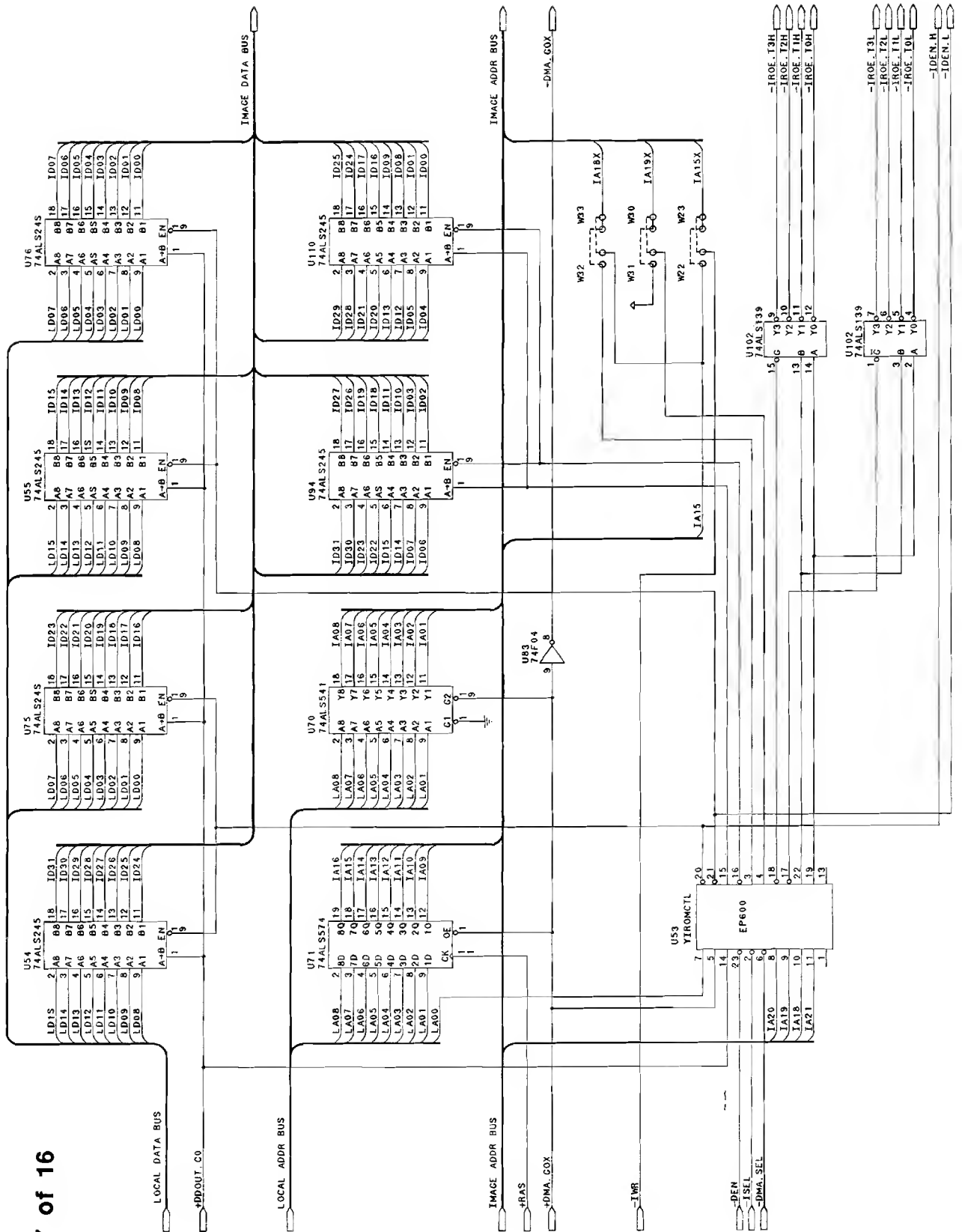
VIDEO ADDR BUS "X"



U3.4		100	1
-VMR_T3	16	W	-VMR_T3X
-VMR_T2	15	W	-VMR_T2X
-VMR_T1	14	W	-VMR_T1X
-VMR_T0	13	W	-VMR_T0X
-VCAS_C1	12	W	-VCAS_C1X
-VCAS_C0	11	W	-VCAS_C0X
-VRAS_C1	10	W	-VRAS_C1X
-VRAS_C0	9	W	-VRAS_C0X

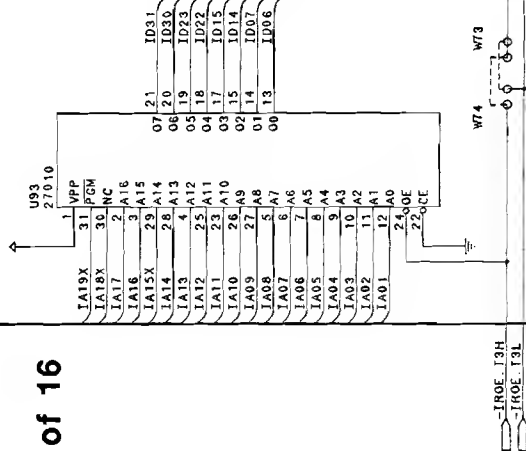






CPU Sheet 8 of 16

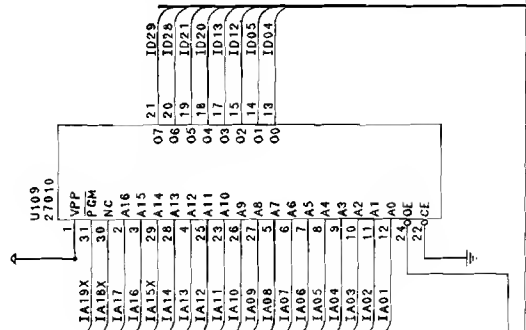
IMAGE ADDRESS BUS



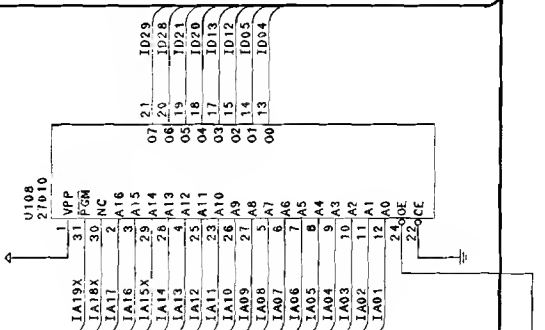
74134
74135

3-12

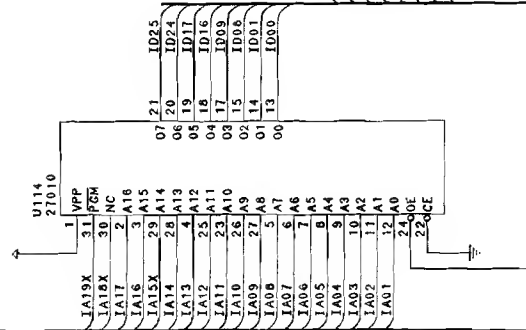
IMAGE MEMORY



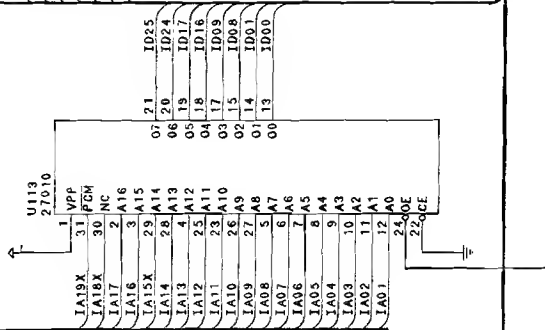
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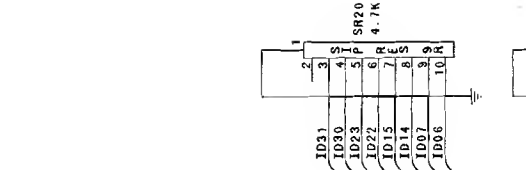
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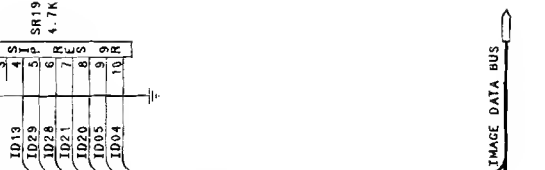
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IMAGE MEMORY

IMAGE ADDRESS BUS

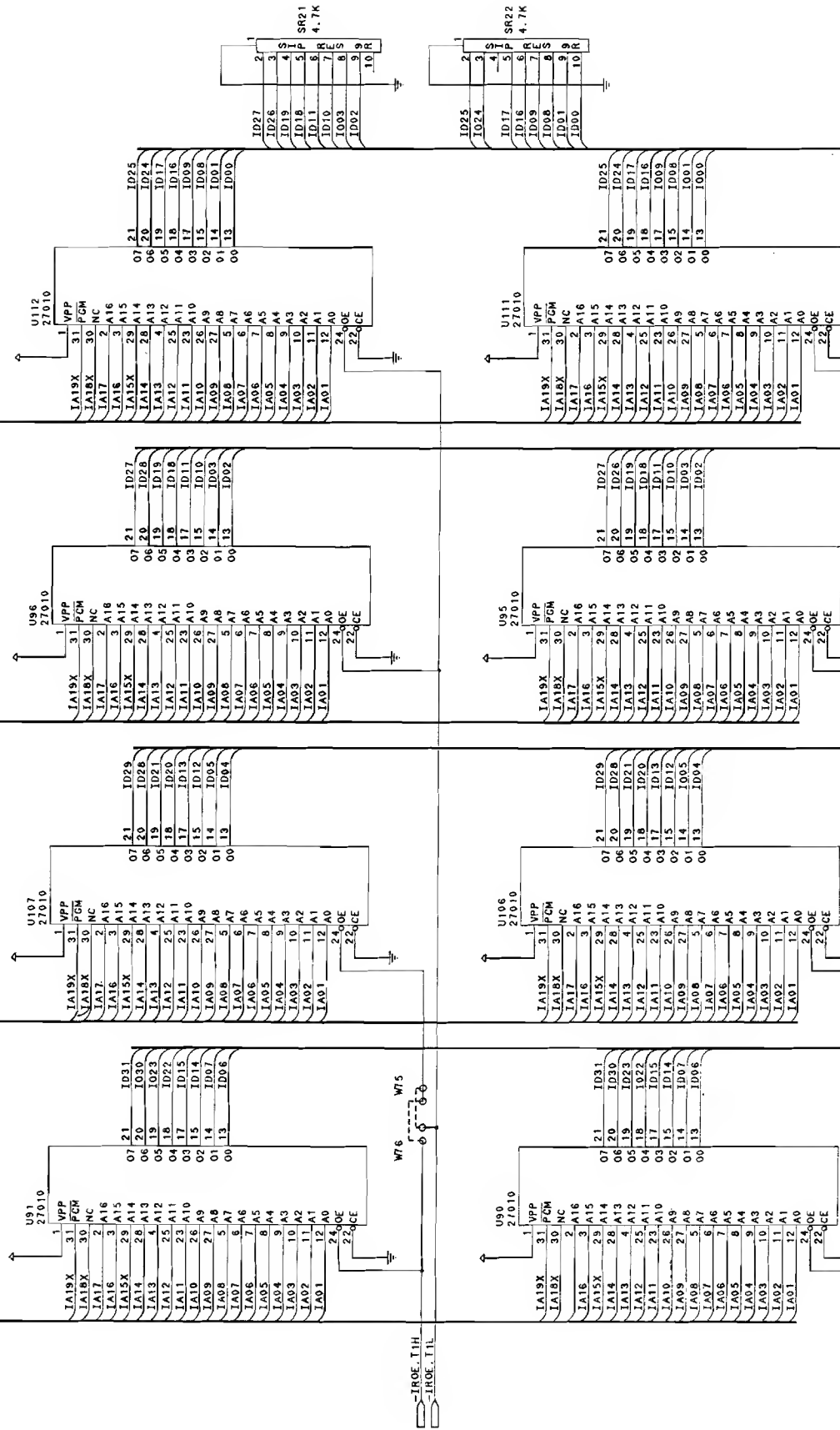
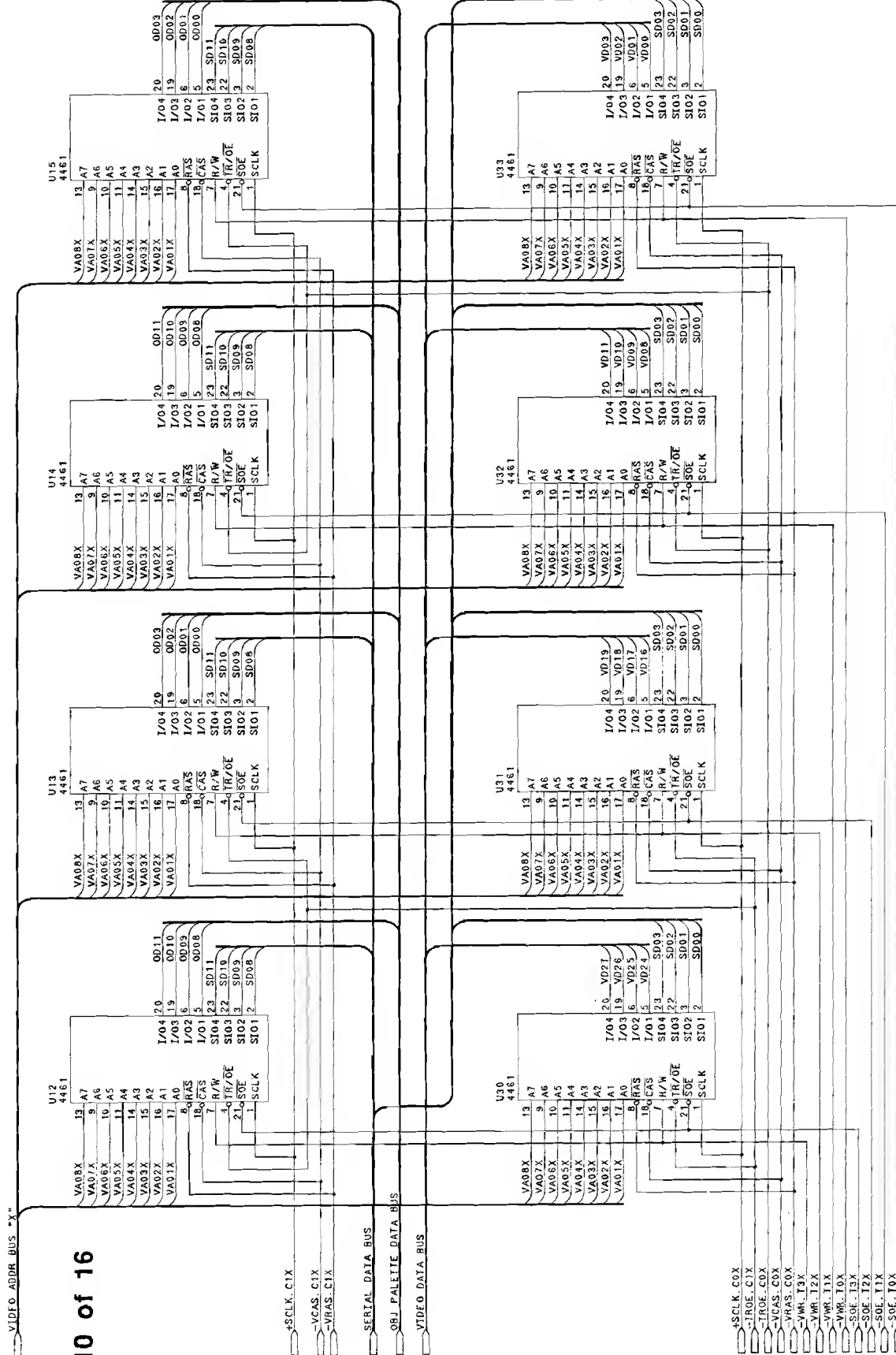
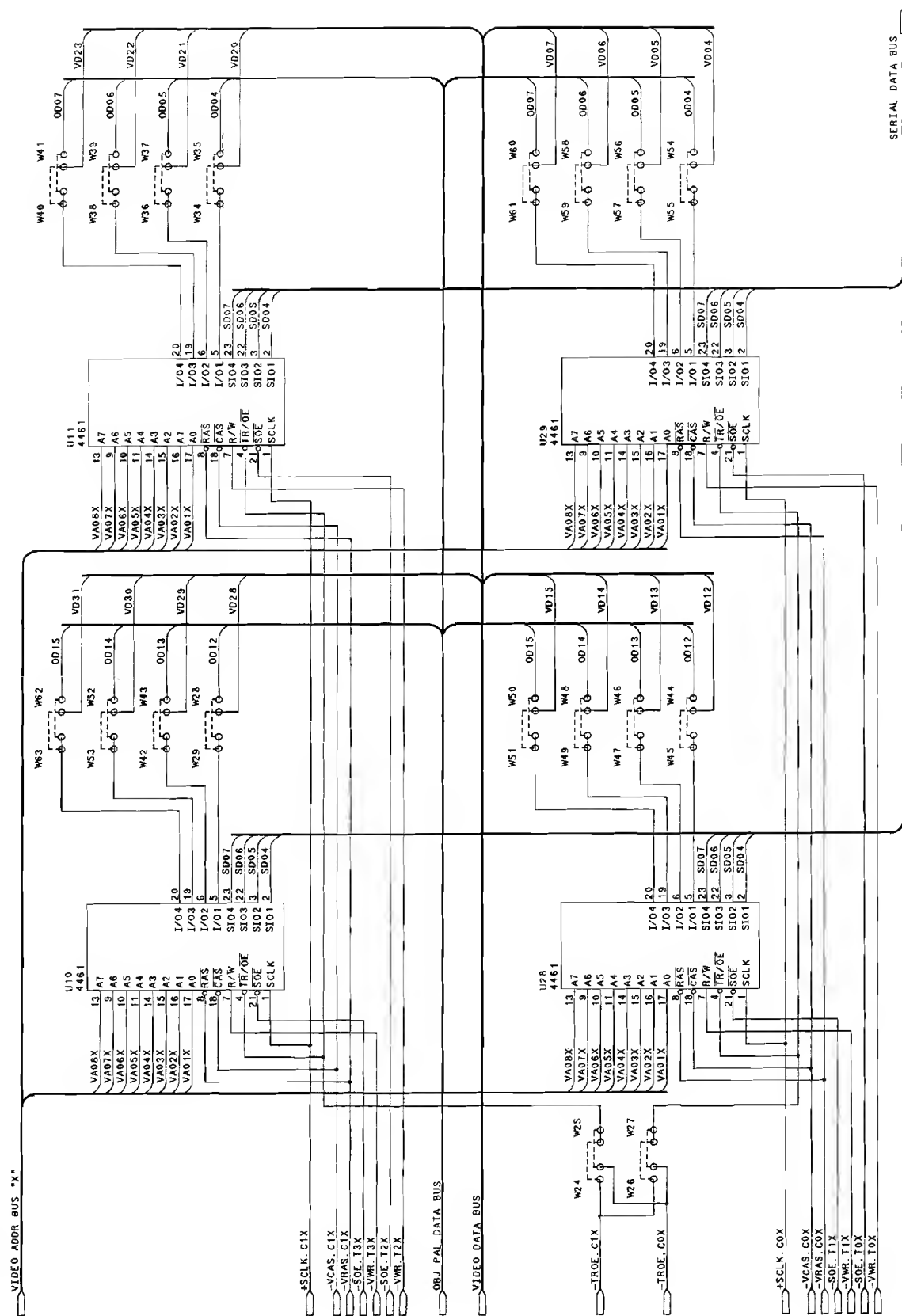


IMAGE DATA BUS

CPU Sheet 10 of 16

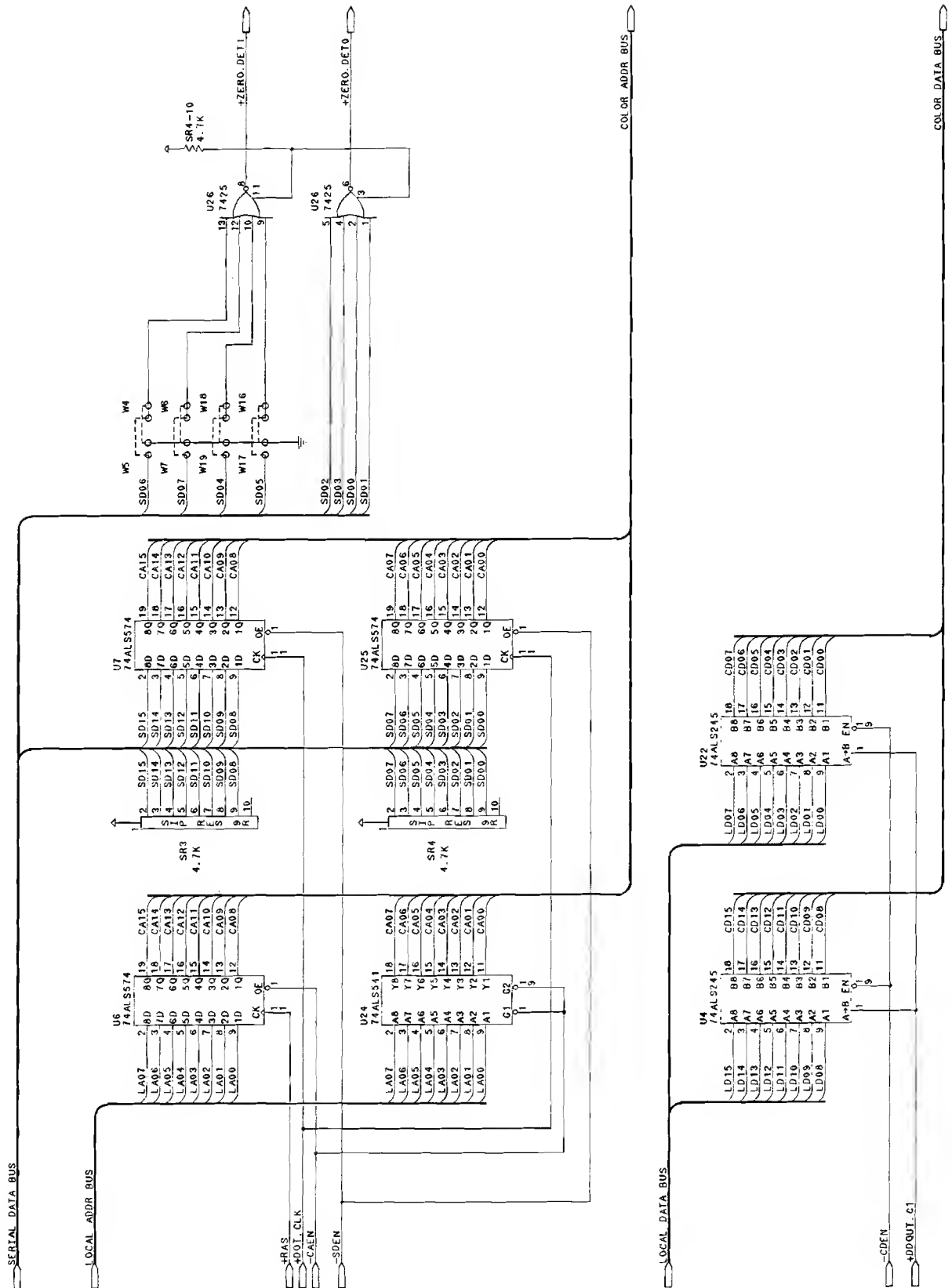


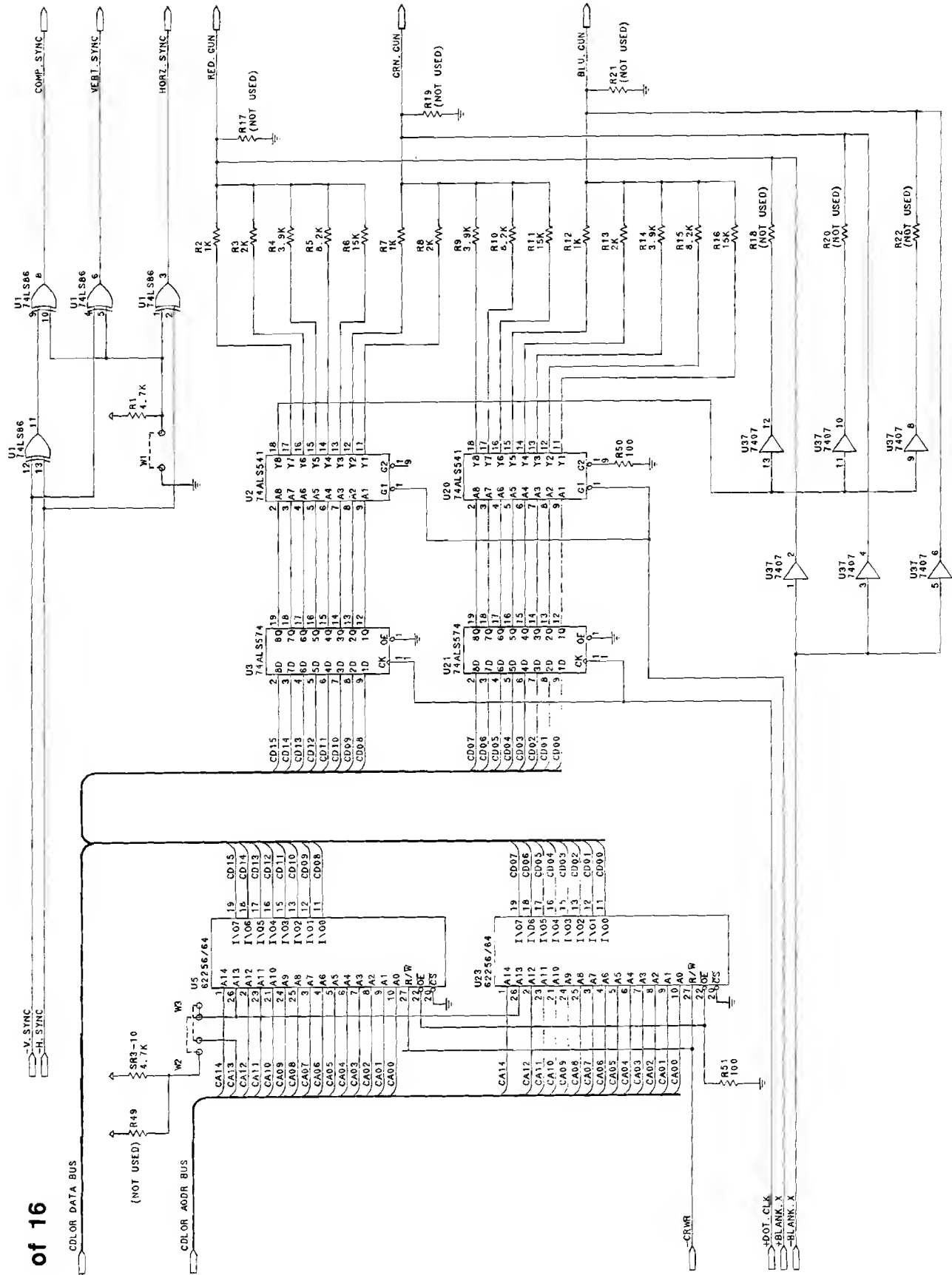
CPU Sheet 11 of 16



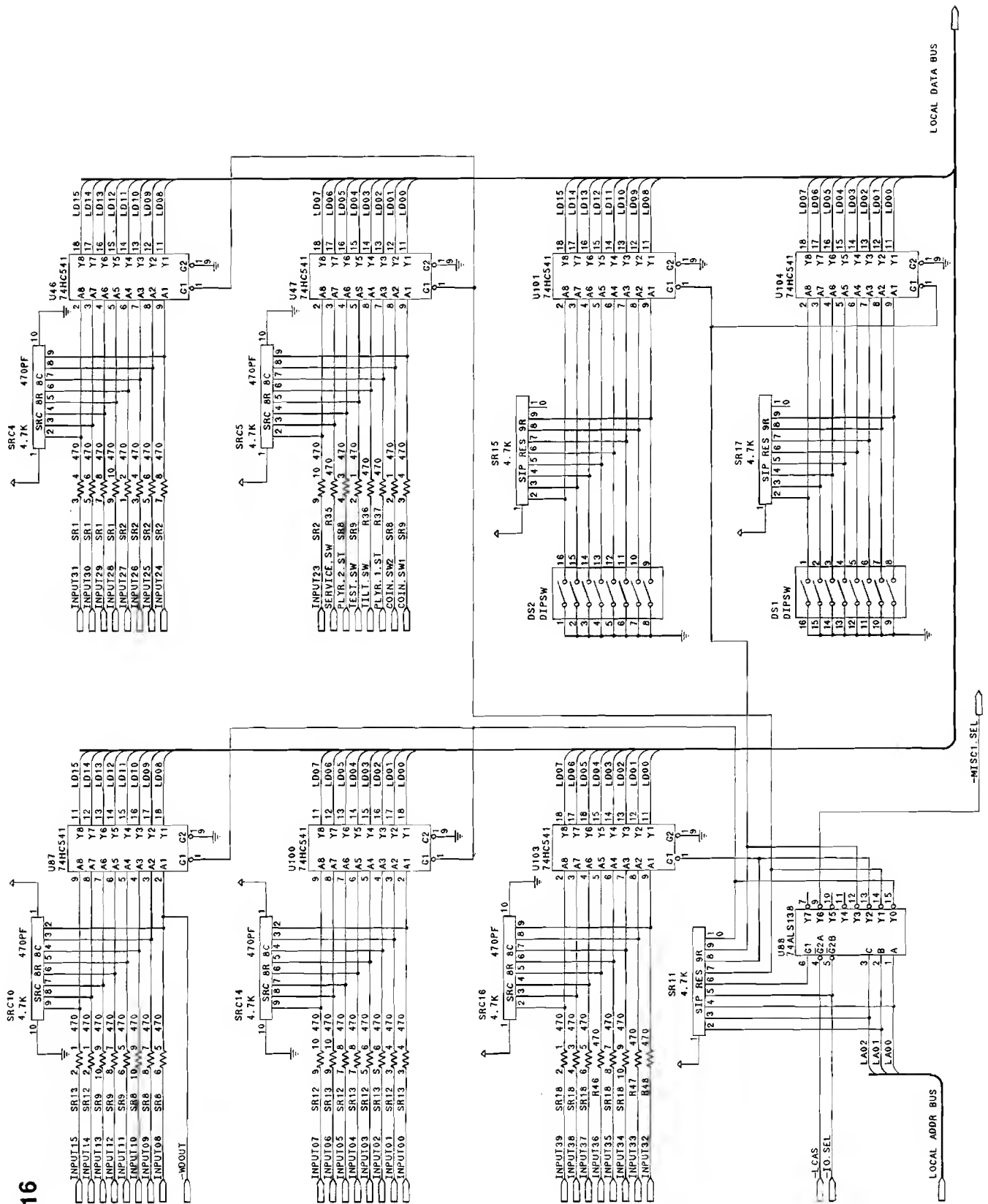
CPD

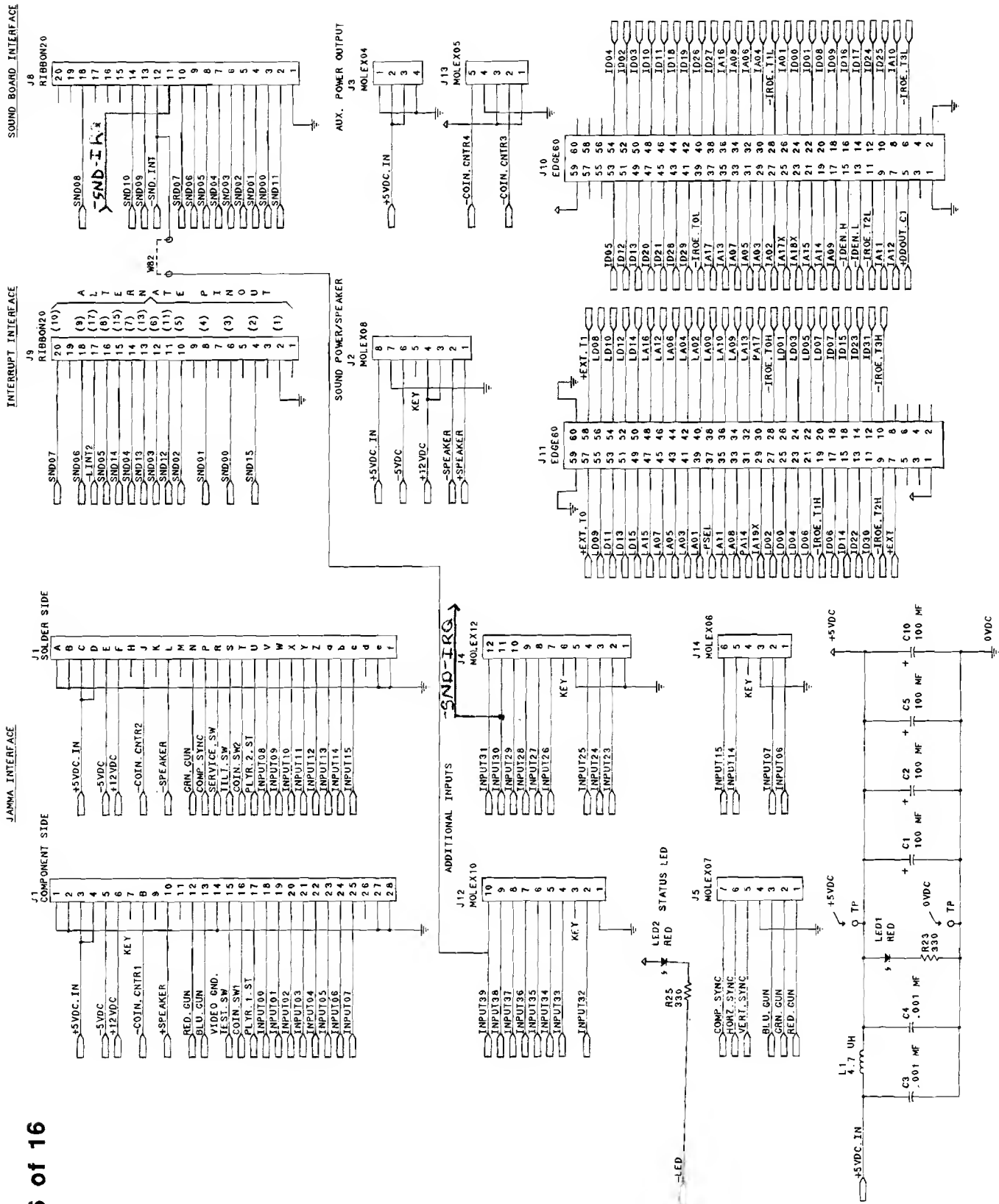


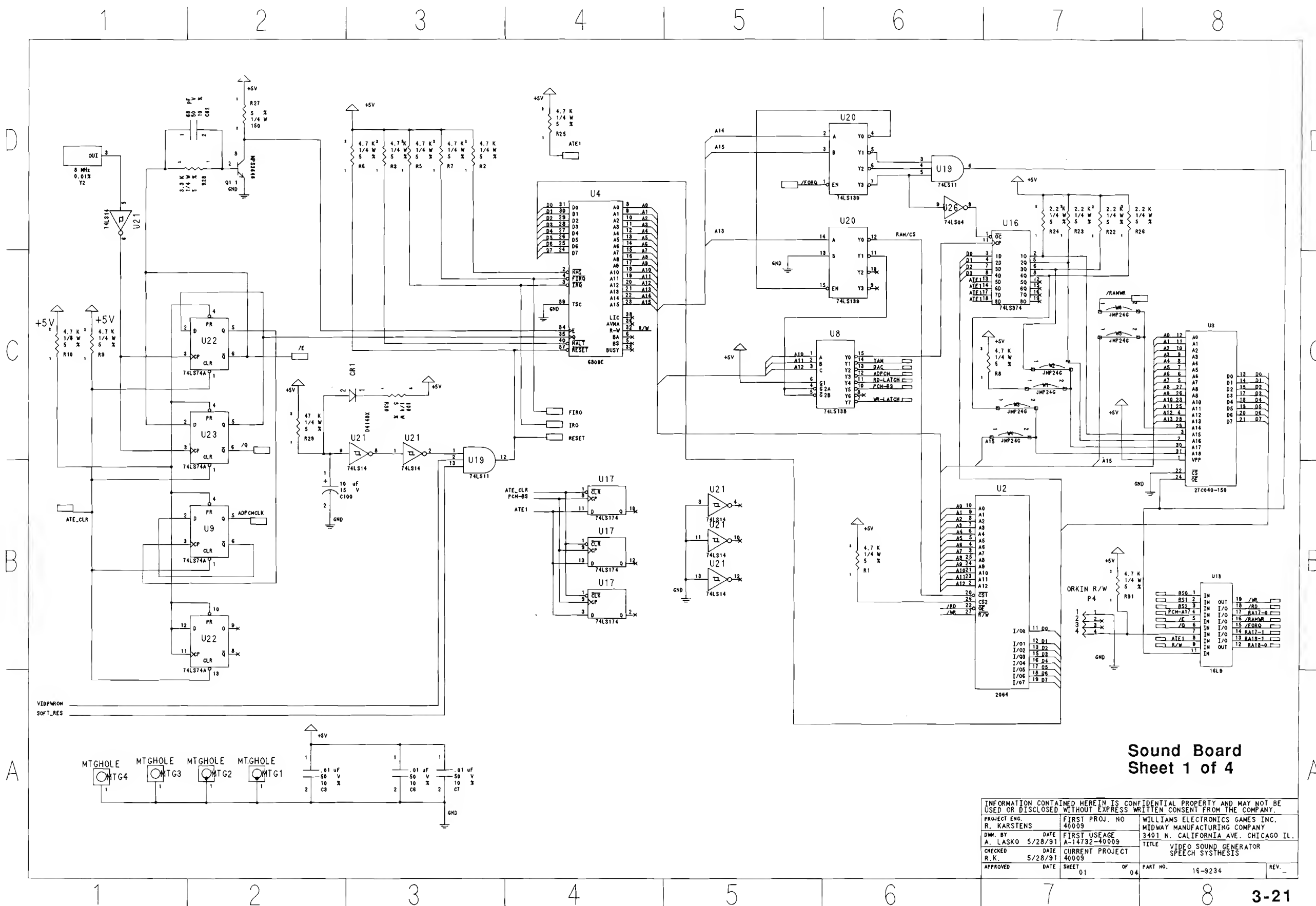




CPU
Sheet 15 of 16

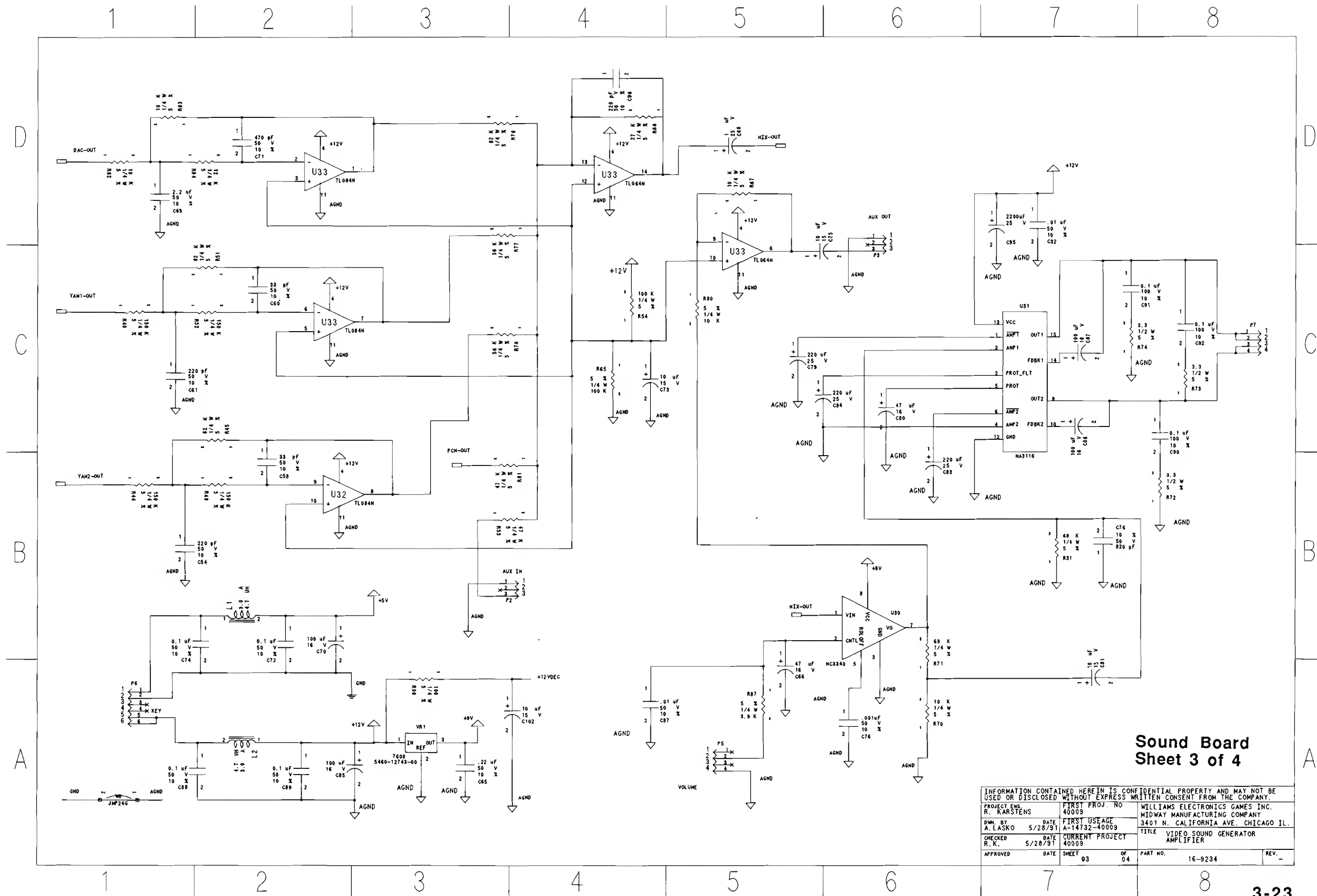


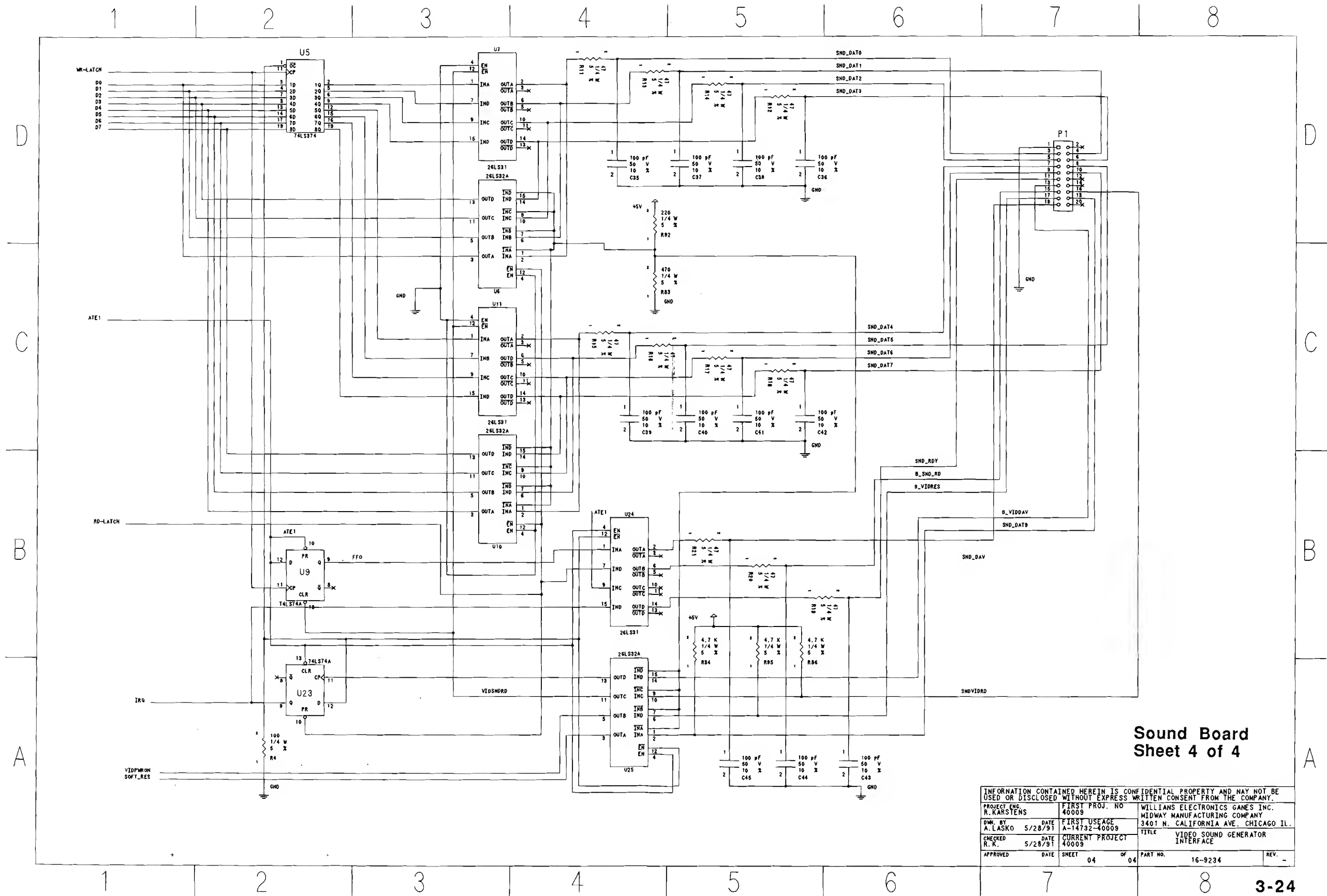




Sound Board
Sheet 1 of 4

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PROJECT ENG.	FIRST PROJ. NO.	WILLIAMS ELECTRONICS GAMES INC.	
R. KARSTENS	40009	MIDWAY MANUFACTURING COMPANY	
DATE	FIRST USEAGE	3401 N. CALIFORNIA AVE. CHICAGO IL.	
5/28/91	A-14732-40009	TITLE	
CHECKED	CURRENT PROJECT	VIDEO SOUND GENERATOR	
R.K.	40009	SPEECH SYSTHEIS	
DATE	SHEET	PART NO.	REV.
5/28/91	01	16-9234	





Sound Board
Sheet 4 of 4

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PROJECT ENG	R. KARSTENS	FIRST PROJ. NO	40009	WILLIAMS ELECTRONICS GAMES INC.	
DATE	5/28/91	FIRST USAGE	A-14732-40009	MIDWAY MANUFACTURING COMPANY	
CHECKED	R. K.	DATE	5/28/91	3401 N. CALIFORNIA AVE. CHICAGO IL.	
APPROVED		CURRENT PROJECT	40009	TITLE VIDEO SOUND GENERATOR INTERFACE	
SHEET	04	OF	04	PART NO.	16-9234
REV.					

Control Panel Wire Colors

Player One

Start	Yellow-Green
Up (Jump)	Orange-Black
Down (Duck)	Orange-Brown
Left (Move)	Orange-Red
Right (Move)	Orange
High Punch	Orange-Yellow
Block	Orange-Green
High Kick	Orange-Blue
Low Punch	Orange-Violet
Low Kick	Orange-Gray
Ground	Black

Player Two

Start	Yellow-Blue
Up (Jump)	Yellow-Black
Down (Duck)	Yellow-Brown
Left (Move)	Yellow-Red
Right (Move)	Yellow-Orange
High Punch	Yellow-Violet
Block	Yellow-Gray
High Kick	Violet-Black
Low Punch	Violet-Brown
Low Kick	Violet-Red
Ground	Black

PC Board Jumpers

CPU Board

W2, W8, W11, W12, W14,
W21, W22, W24, W27, W29,
W30, W32, W34, W36, W39,
W41, W42, W45, W47, W48,
W50, W52, W55, W57, W58,
W60, W62, W65, W68, W69,
W71, W73, W75, W77, W80

Sound Board

W2, W3, W5, W7, W8

WARNINGS & NOTICES

Warning

USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.

* For safety and reliability, substitute parts and modifications are not recommended.

* Substitute parts or modifications may void FCC type acceptance.

* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under Federal law. This also applies to MIDWAY logos, designs, publications and assemblies. Moreover, facsimiles of MIDWAY equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with MIDWAY components.

Warning

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning

Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

Notice

When MIDWAY ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC sticker, call MIDWAY immediately.

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